Tested 02en9268

FIG. 1

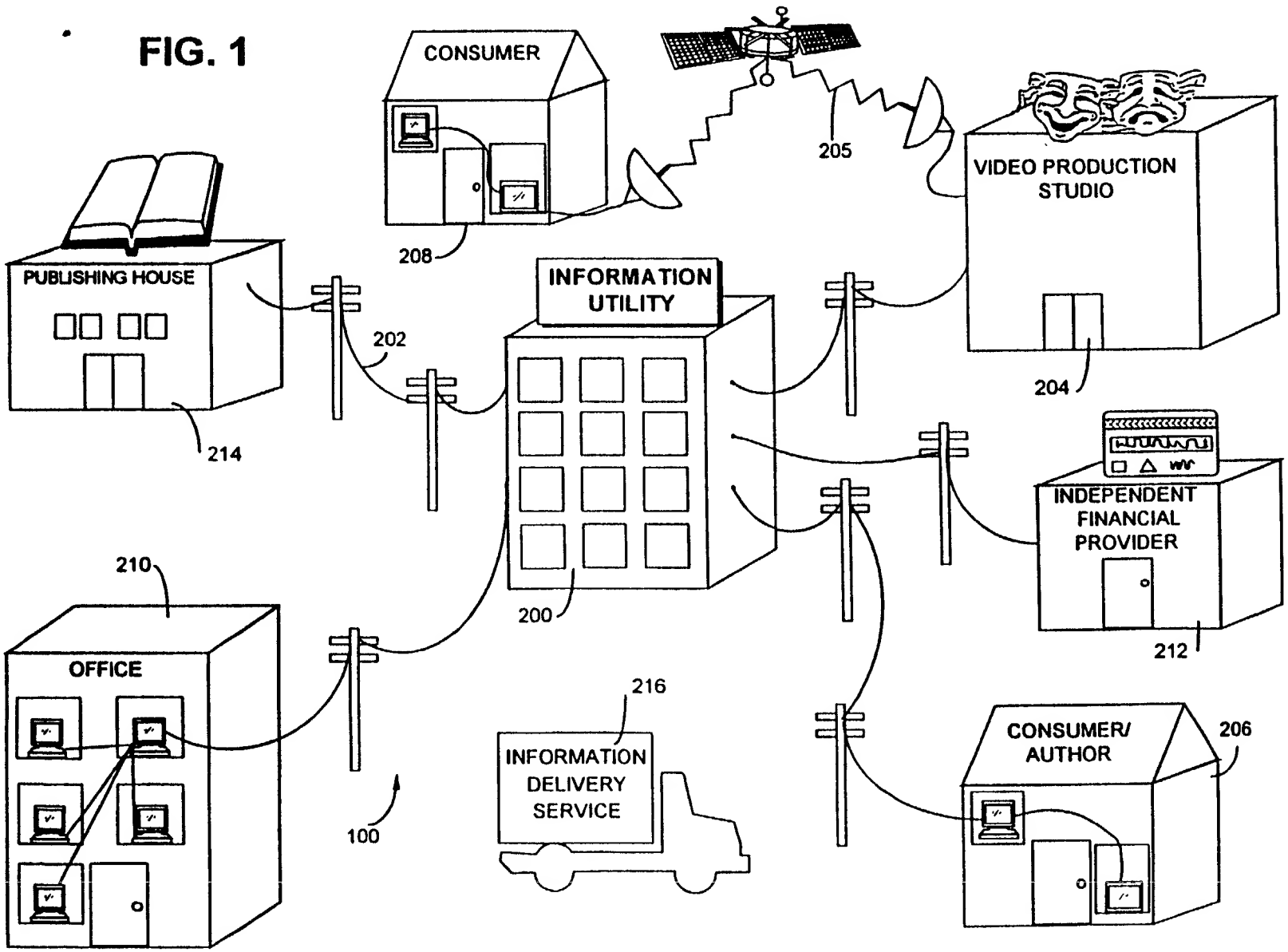


FIG. 1A

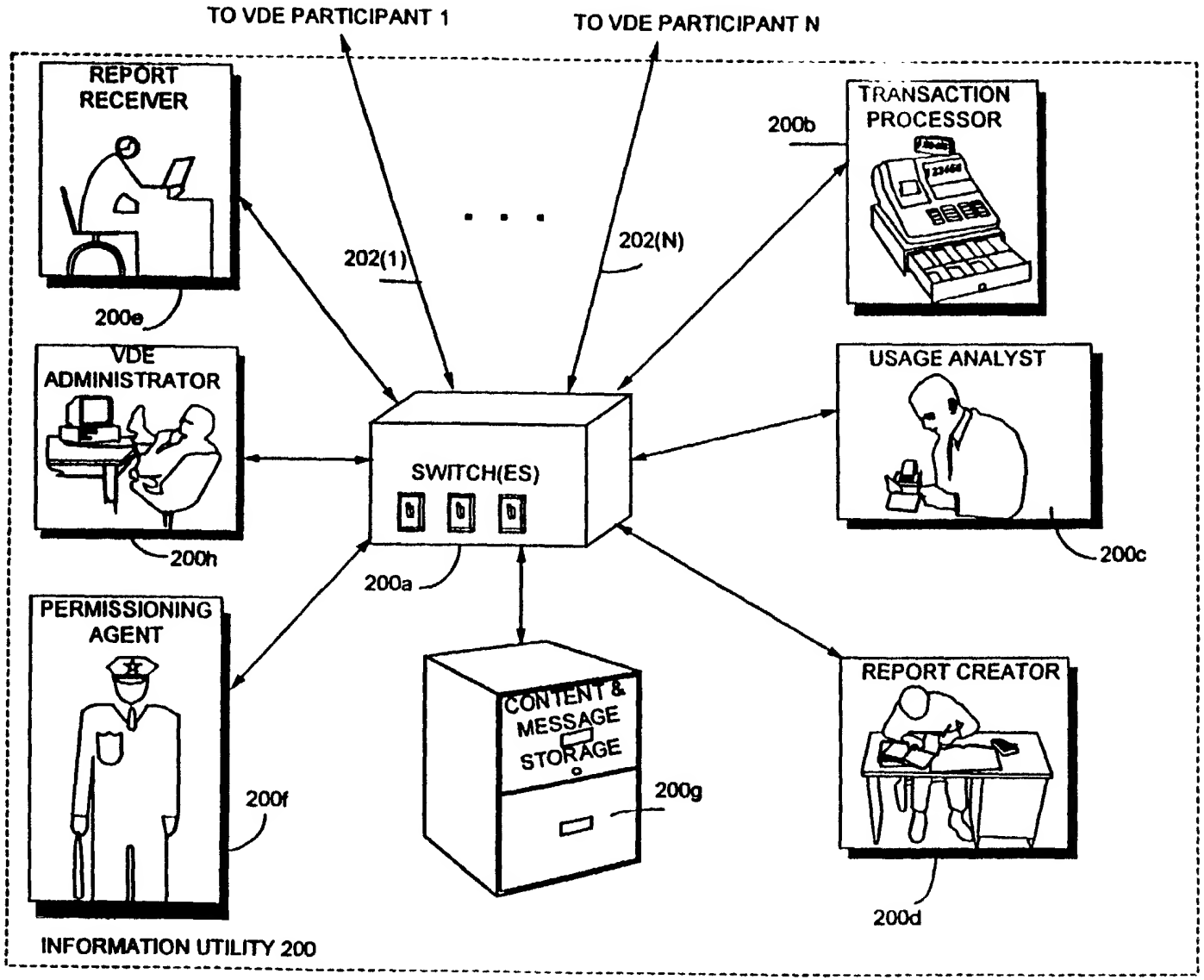

TO VDE PARTICIPANT 1
TO VDE PARTICIPANT N
REPORT RECEIVER
200e
202(1)
202(N)
TRANSACTION PROCESSOR
200b
VDE ADMINISTRATOR
200h
SWITCH(ES)
200a
USAGE ANALYST
200c
PERMISSIONING AGENT
200f
CONTENT & MESSAGE STORAGE
200g
REPORT CREATOR
200d
INFORMATION UTILITY 200

FIG. 2

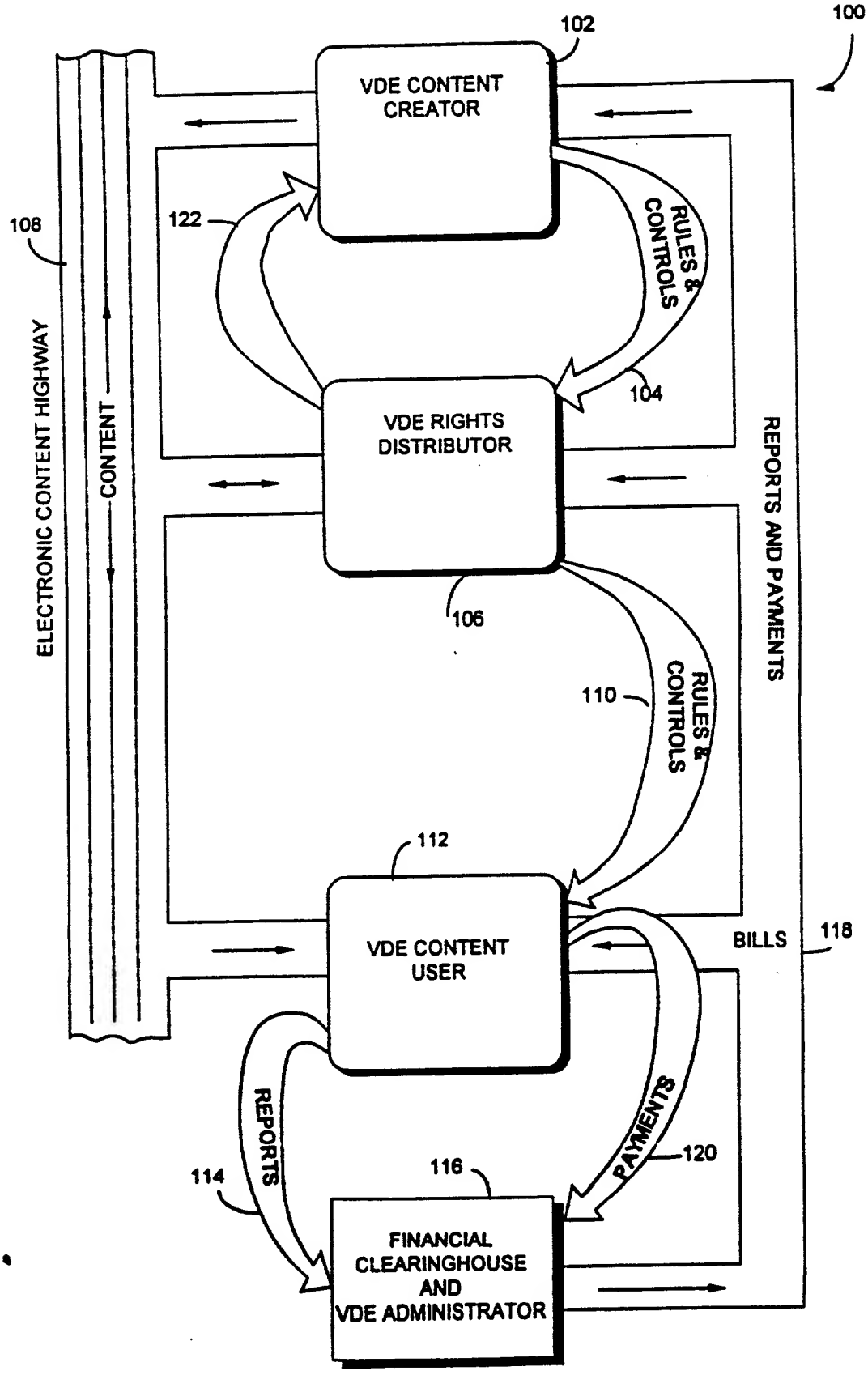

100
102
VDE CONTENT CREATOR
122
RULES & CONTROLS
104
108
ELECTRONIC CONTENT HIGHWAY
CONTENT
VDE RIGHTS DISTRIBUTOR
REPORTS AND PAYMENTS
106
110
RULES & CONTROLS
112
VDE CONTENT USER
BILLS
118
REPORTS
PAYMENTS
120
114
116
FINANCIAL CLEARINGHOUSE AND VDE ADMINISTRATOR

FIG. 2A

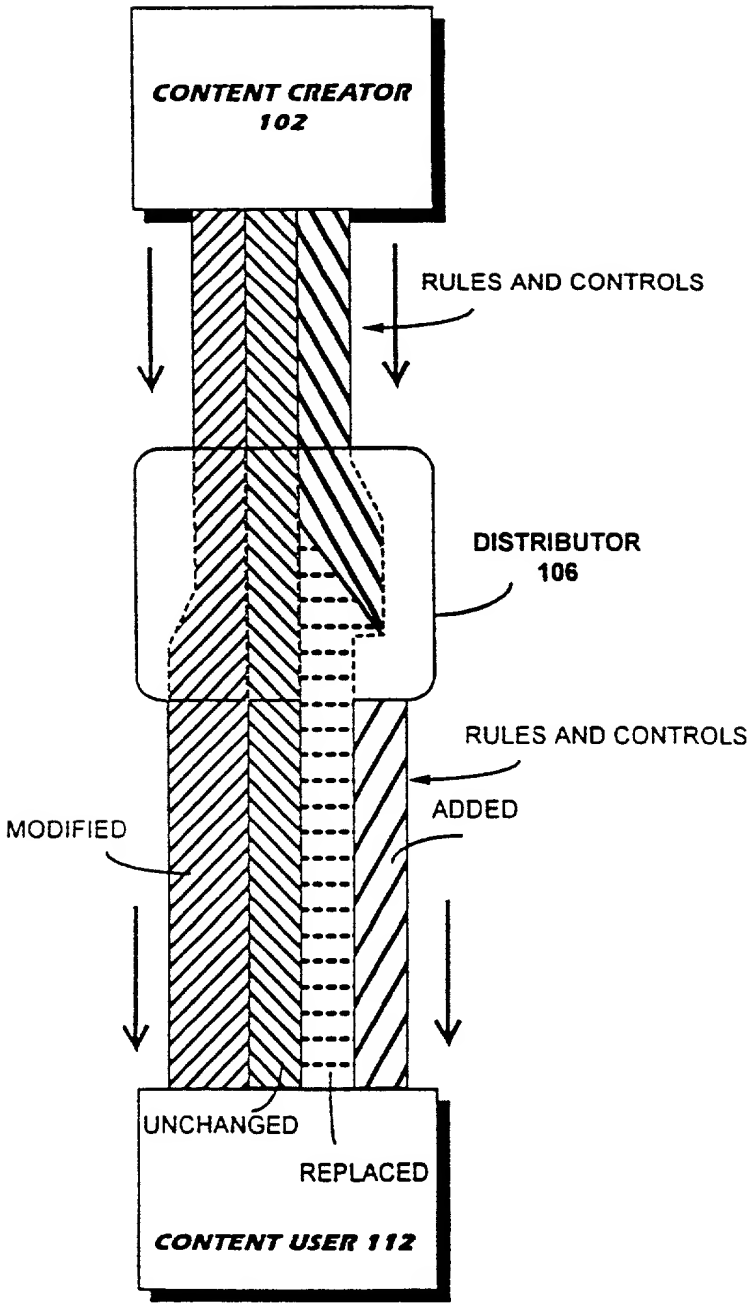
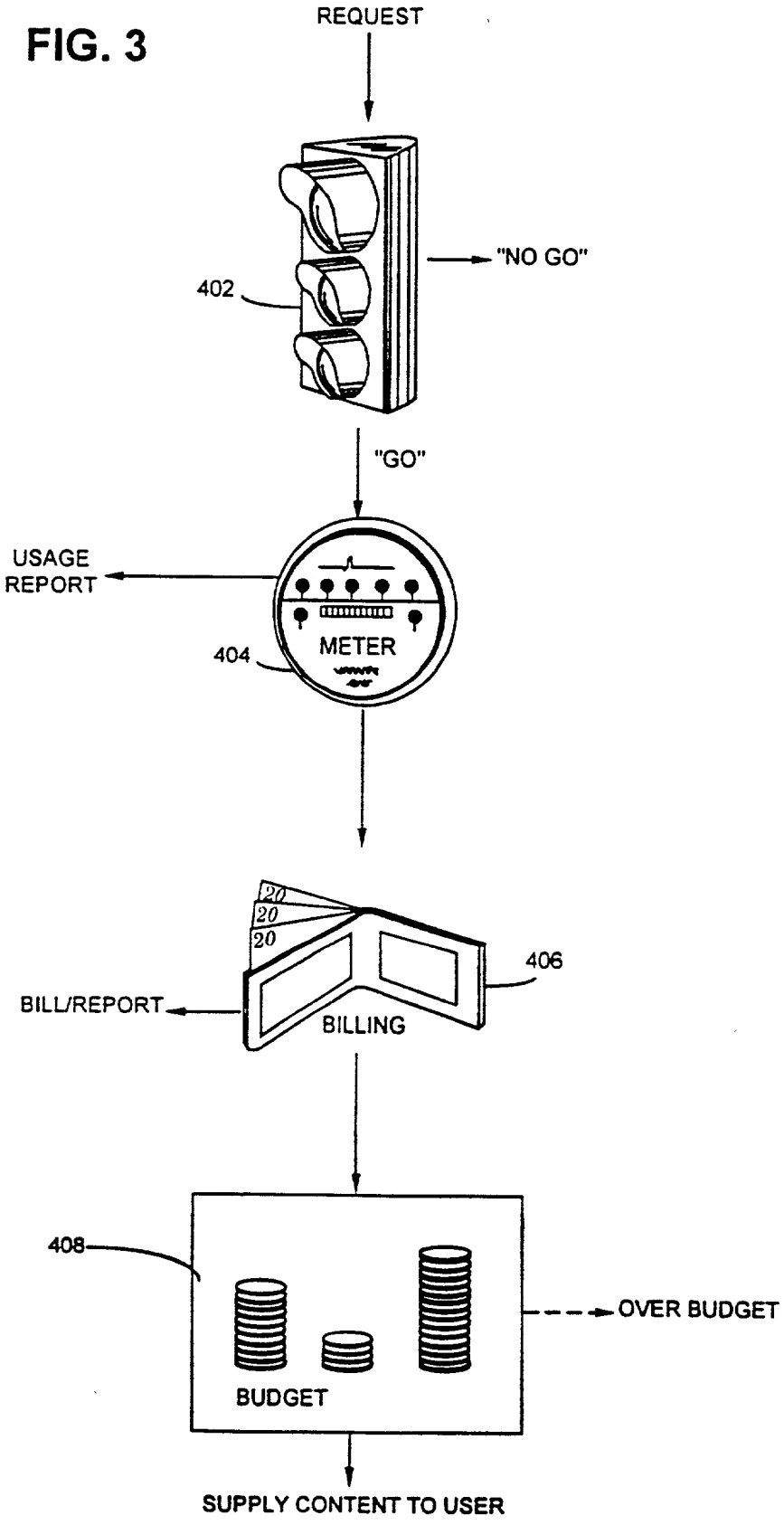

CONTENT CREATOR
102
RULES AND CONTROLS
DISTRIBUTOR
106
RULES AND CONTROLS
ADDED
MODIFIED
UNCHANGED
REPLACED
CONTENT USER 112

FIG. 3


REQUEST
"NO GO"
402
"GO"
USAGE
REPORT
METER
404
20
20
20
406
BILL/REPORT
BILLING
408
OVER BUDGET
BUDGET
SUPPLY CONTENT TO USER

Tech Center 2600

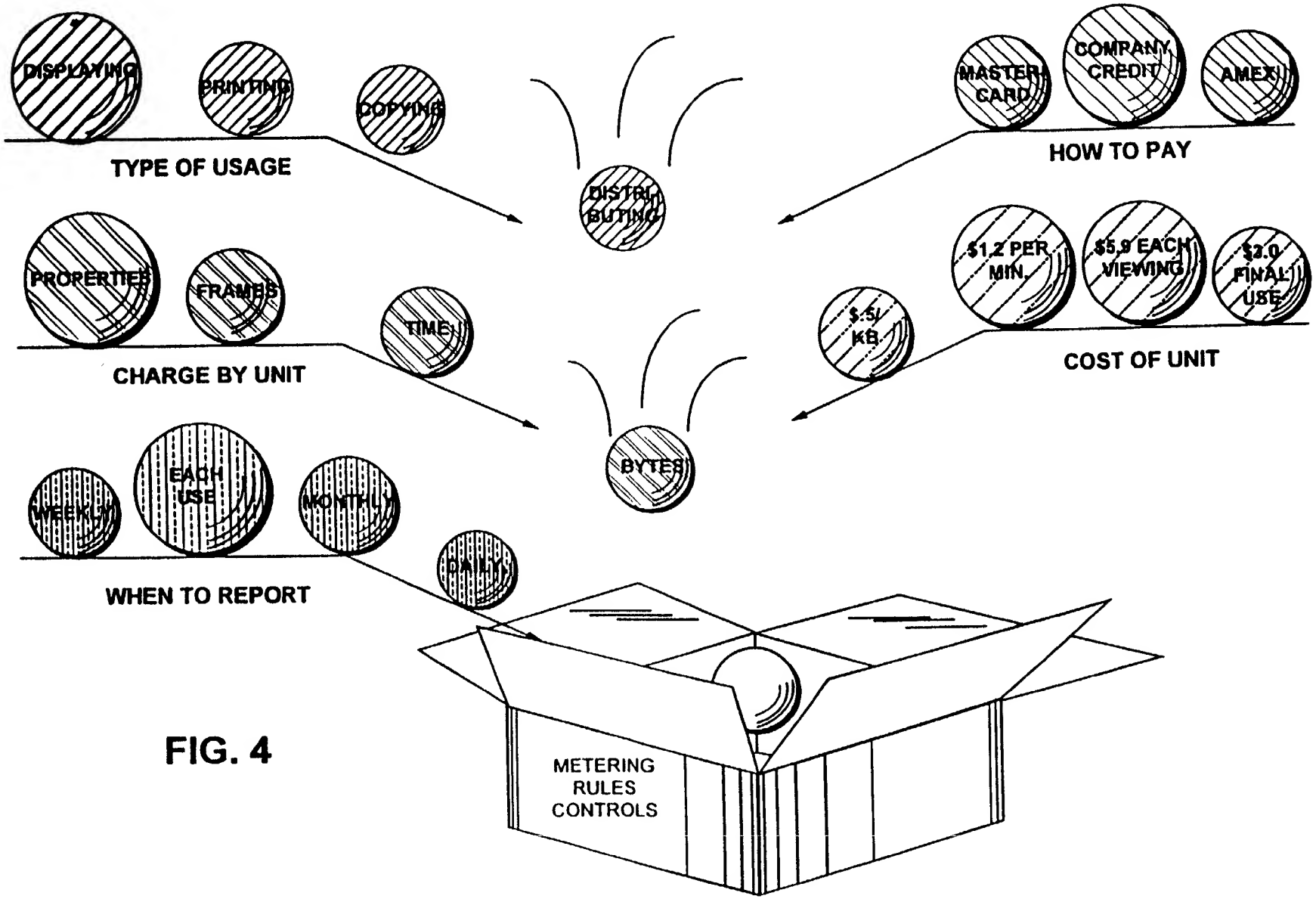


FIG. 4

FIG. 5A

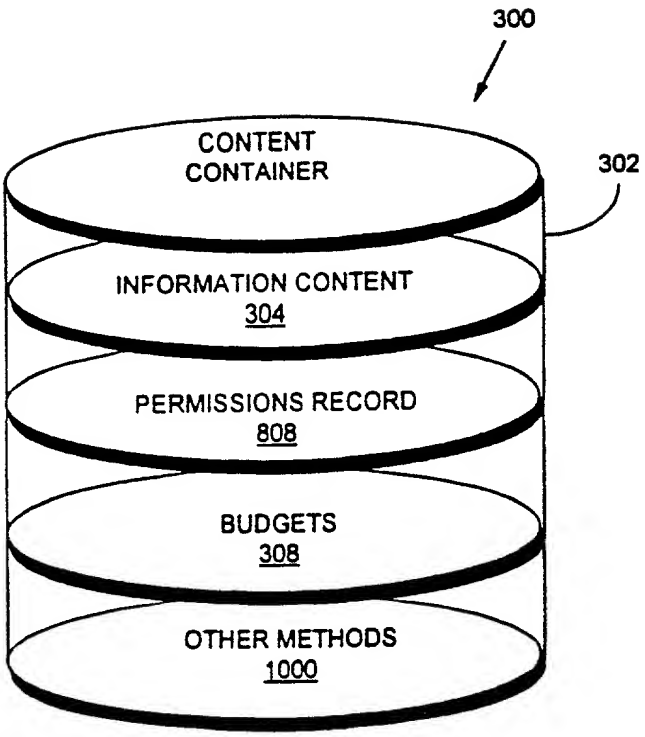

300
CONTENT CONTAINER
302
INFORMATION CONTENT
304
PERMISSIONS RECORD
808
BUDGETS
308
OTHER METHODS
1000

FIG. 5B

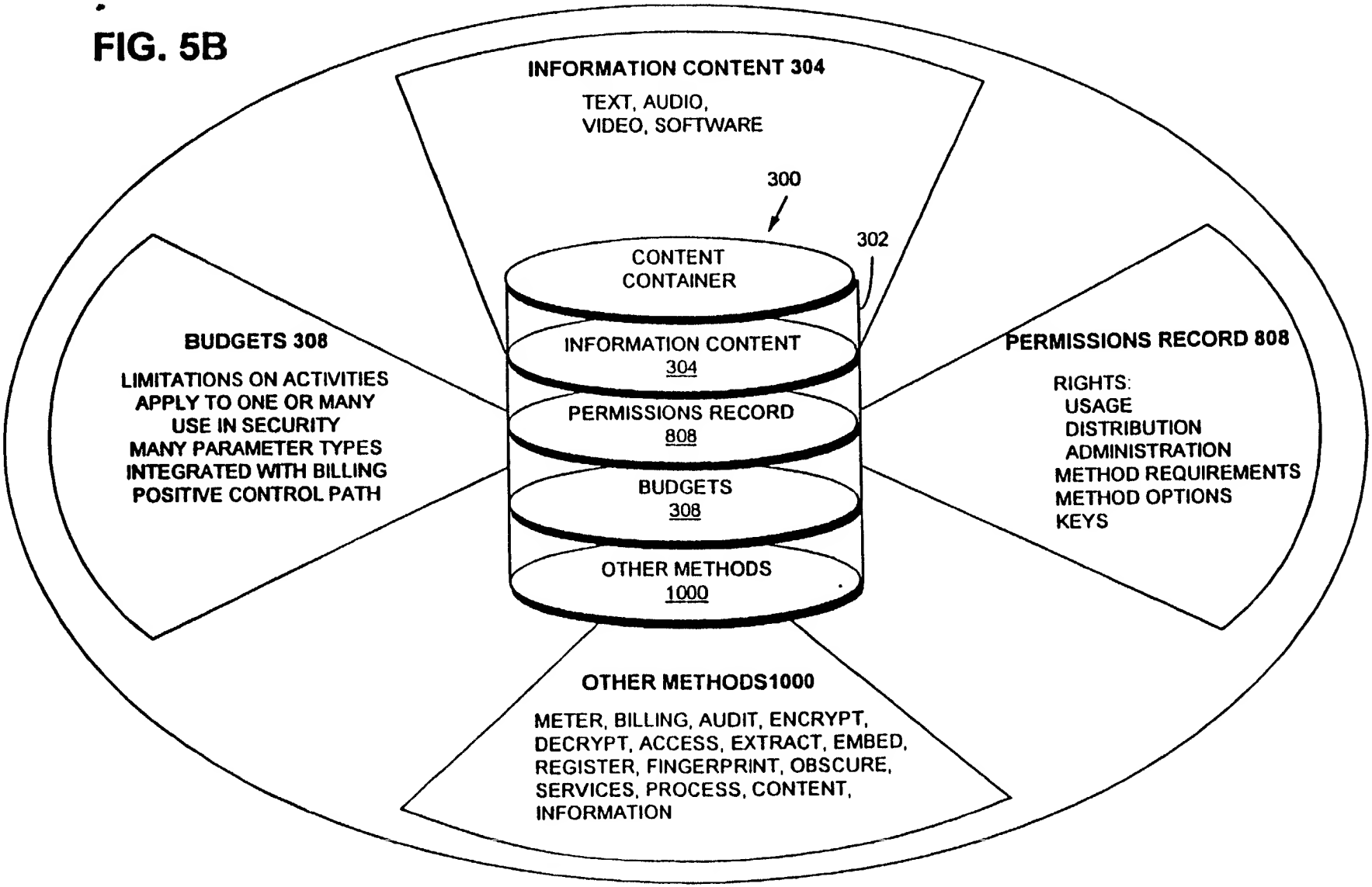

INFORMATION CONTENT 304
TEXT, AUDIO,
VIDEO, SOFTWARE
300
302
CONTENT
CONTAINER
INFORMATION CONTENT
304
PERMISSIONS RECORD
808
BUDGETS
308
OTHER METHODS
1000
BUDGETS 308
LIMITATIONS ON ACTIVITIES
APPLY TO ONE OR MANY
USE IN SECURITY
MANY PARAMETER TYPES
INTEGRATED WITH BILLING
POSITIVE CONTROL PATH
PERMISSIONS RECORD 808
RIGHTS:
USAGE
DISTRIBUTION
ADMINISTRATION
METHOD REQUIREMENTS
METHOD OPTIONS
KEYS
OTHER METHODS1000
METER, BILLING, AUDIT, ENCRYPT,
DECRYPT, ACCESS, EXTRACT, EMBED,
REGISTER, FINGERPRINT, OBSCURE,
SERVICES, PROCESS, CONTENT,
INFORMATION

FIG. 6

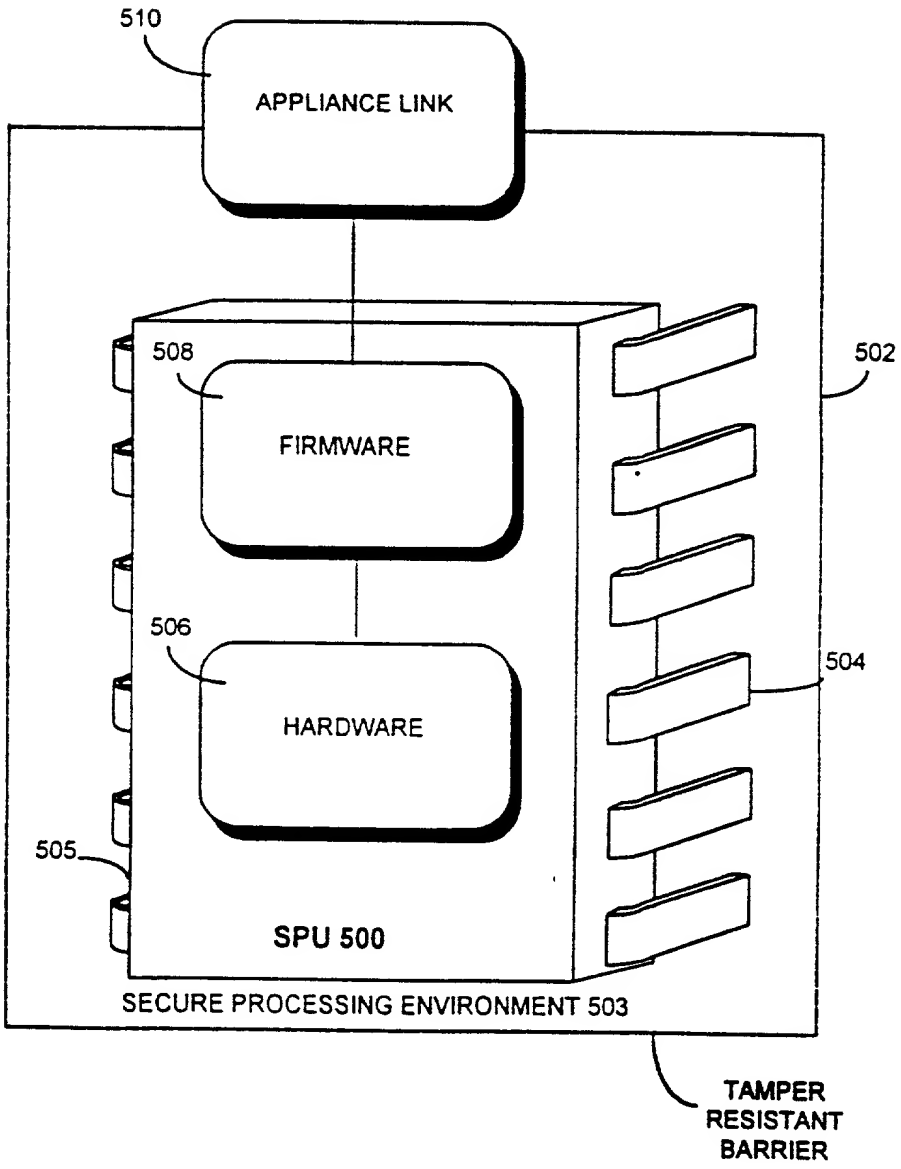

510
APPLIANCE LINK
508
FIRMWARE
506
HARDWARE
505
SPU 500
502
504
SECURE PROCESSING ENVIRONMENT 503
TAMPER
RESISTANT
BARRIER

FIG. 7

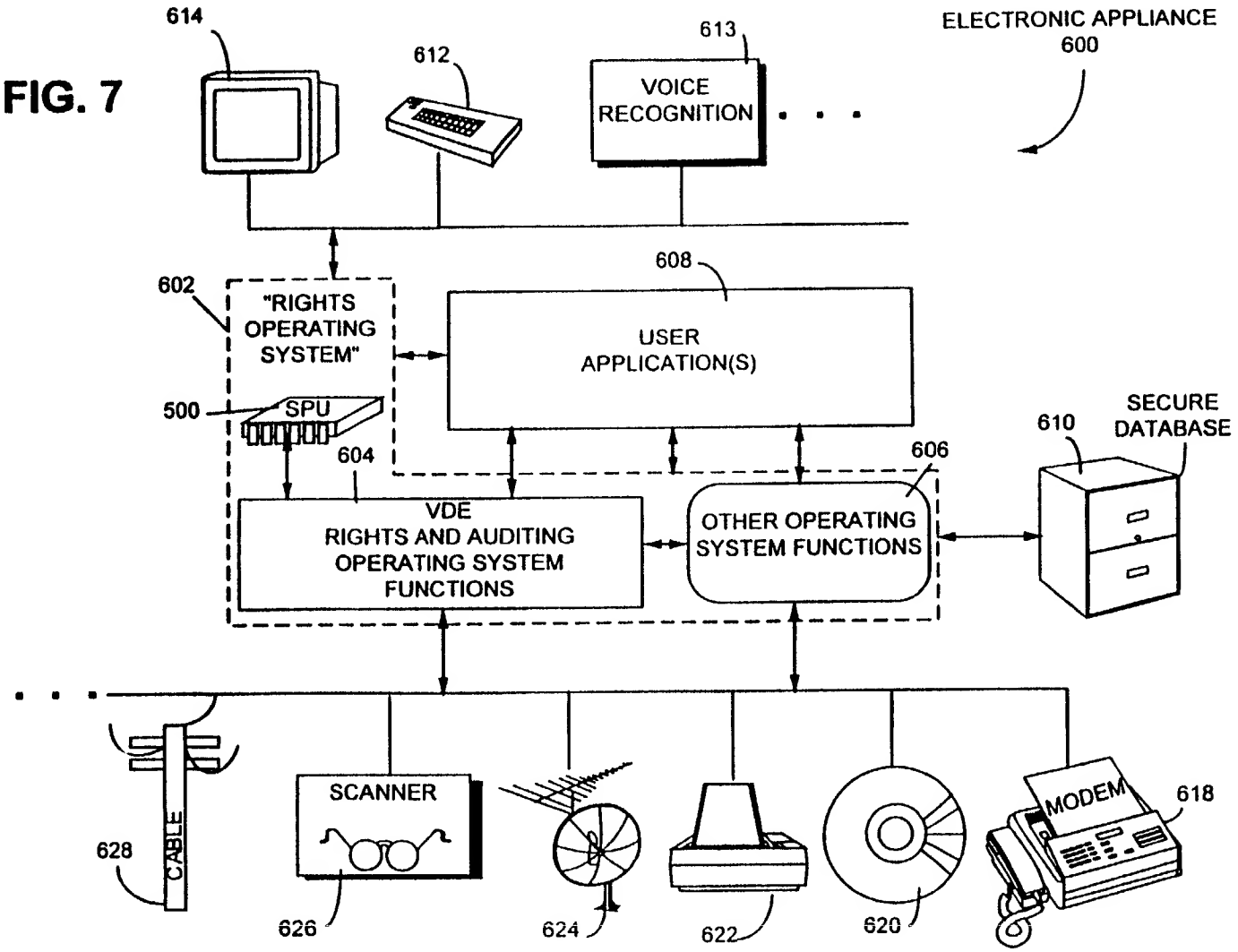
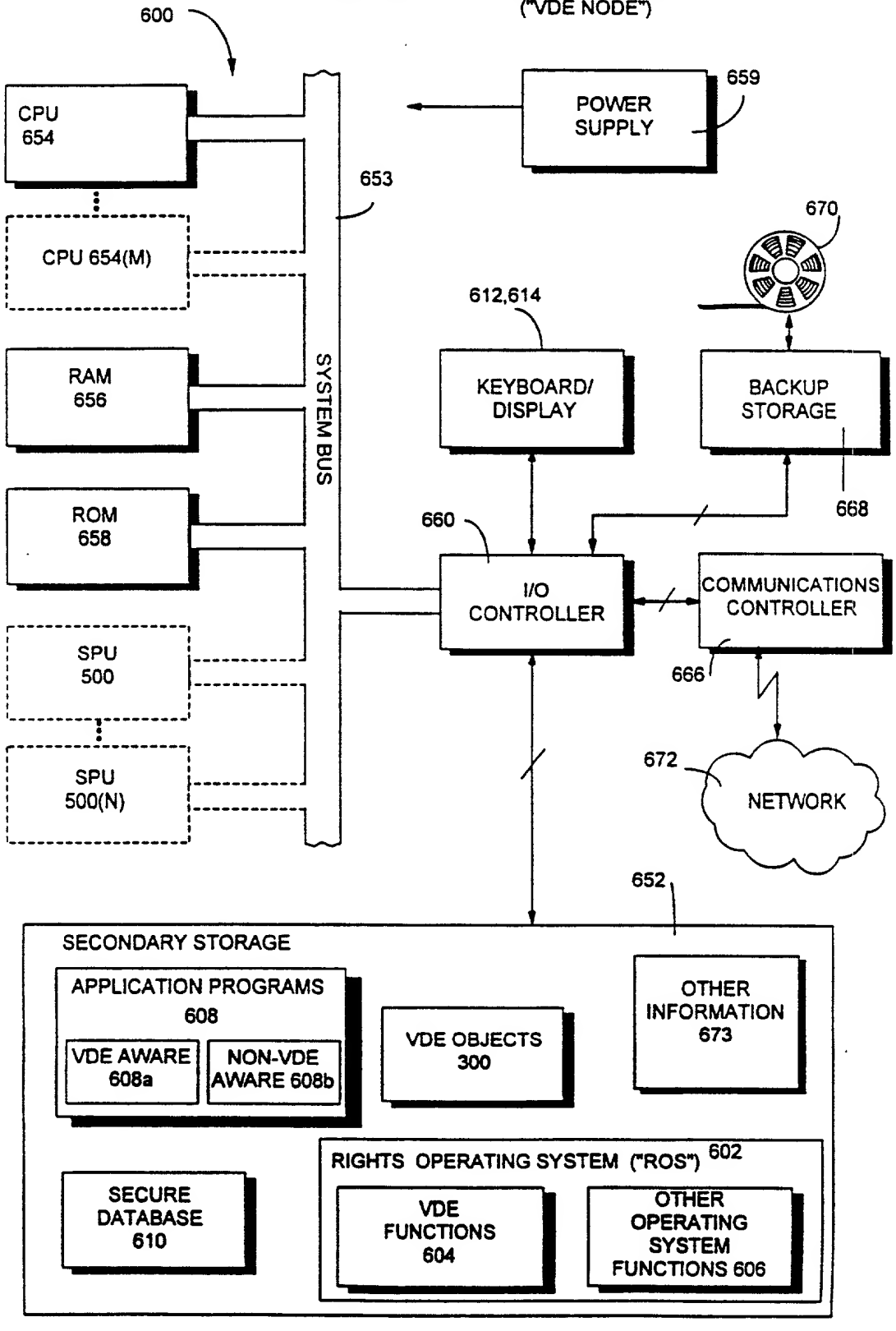
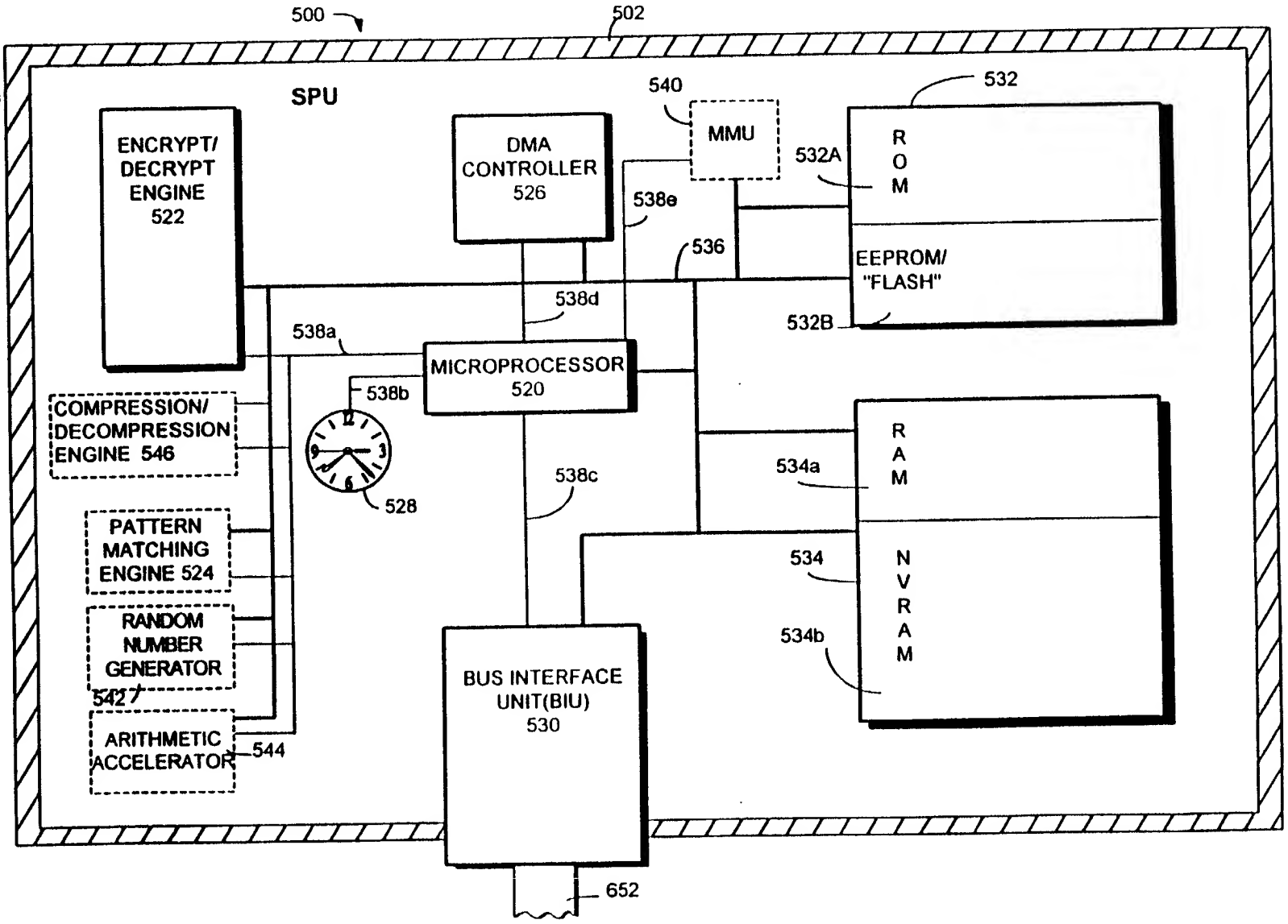

614
612
613
VOICE RECOGNITION
ELECTRONIC APPLIANCE
600
602
"RIGHTS OPERATING SYSTEM"
608
USER APPLICATION(S)
500
SPU
604
606
610
SECURE DATABASE
VDE RIGHTS AND AUDITING OPERATING SYSTEM FUNCTIONS
OTHER OPERATING SYSTEM FUNCTIONS
CABLE
628
SCANNER
626
624
622
620
MODEM
618

FIG. 8 ELECTRONIC APPLIANCE 600 ("VDE NODE")



5687P0-02EN3260

FIG. 9



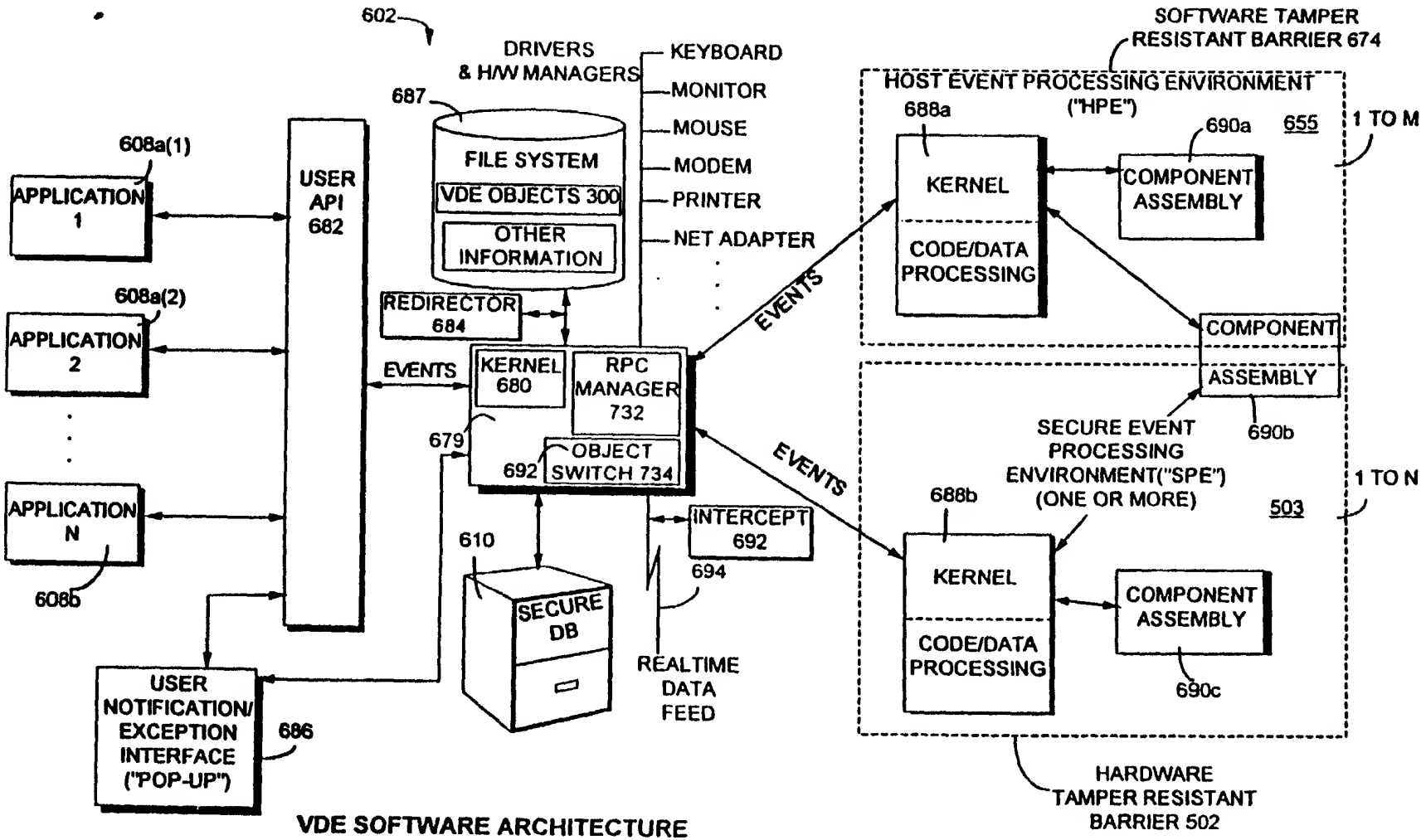

602
DRIVERS & H/W MANAGERS
KEYBOARD
MONITOR
MOUSE
MODEM
PRINTER
NET ADAPTER
687
FILE SYSTEM
VDE OBJECTS 300
OTHER INFORMATION
REDIRECTOR 684
608a(1)
APPLICATION 1
608a(2)
APPLICATION 2
APPLICATION N
608b
USER API 682
EVENTS
KERNEL 680
RPC MANAGER 732
679
692
OBJECT SWITCH 734
INTERCEPT 692
694
610
SECURE DB
REALTIME DATA FEED
USER NOTIFICATION/ EXCEPTION INTERFACE ("POP-UP")
686
VDE SOFTWARE ARCHITECTURE
SOFTWARE TAMPER RESISTANT BARRIER 674
HOST EVENT PROCESSING ENVIRONMENT ("HPE")
688a
KERNEL
CODE/DATA PROCESSING
690a
COMPONENT ASSEMBLY
655
1 TO M
COMPONENT ASSEMBLY
690b
SECURE EVENT PROCESSING ENVIRONMENT("SPE") (ONE OR MORE)
503
1 TO N
688b
KERNEL
CODE/DATA PROCESSING
COMPONENT ASSEMBLY
690c
HARDWARE TAMPER RESISTANT BARRIER 502

FIG. 10

DOCKET NO. 2

FIG. 11A

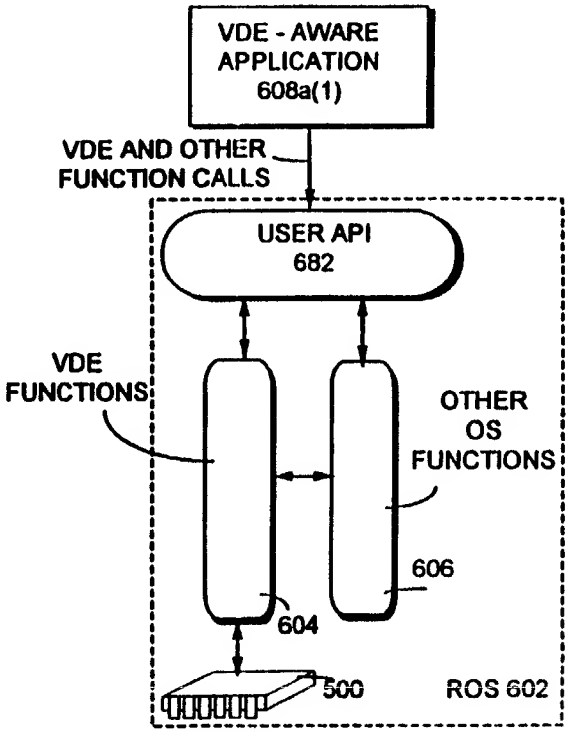


FIG. 11B

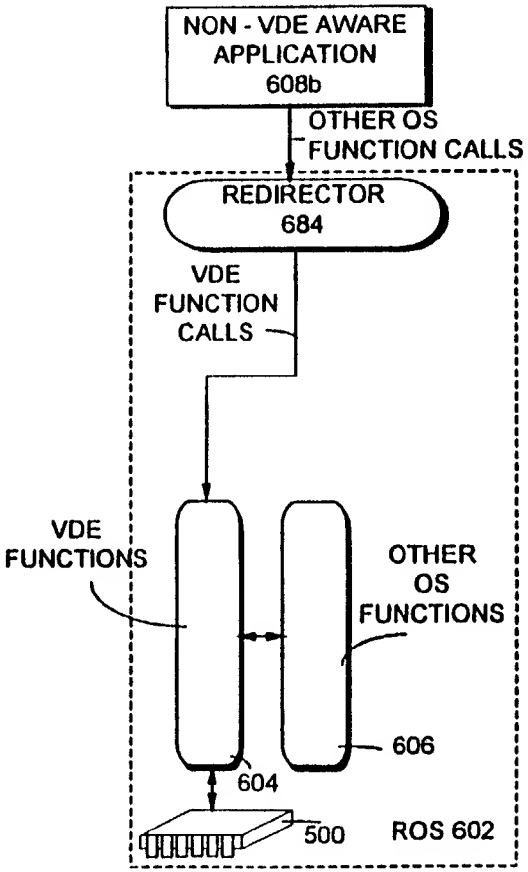
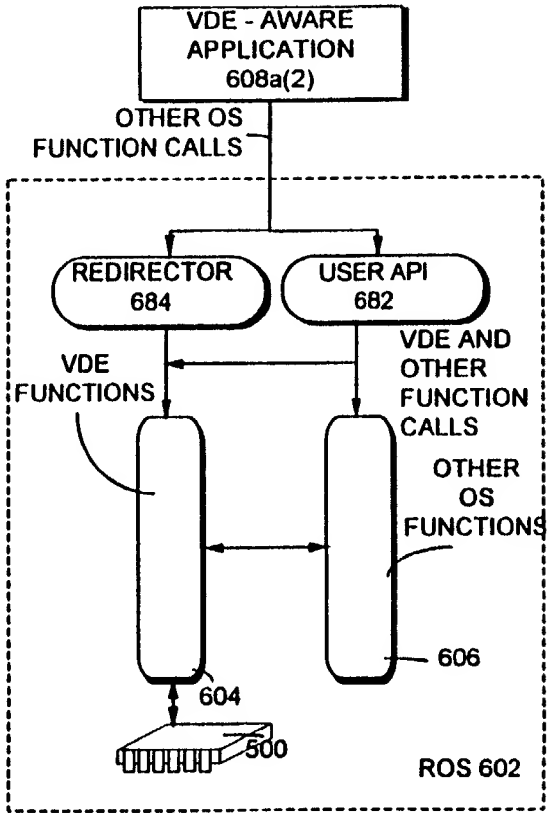


FIG. 11C



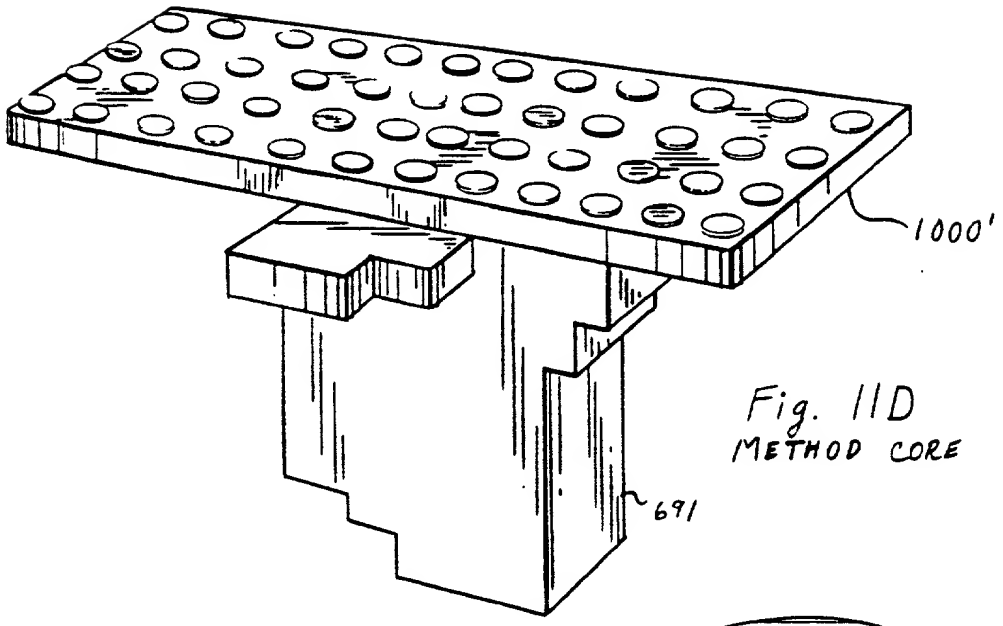


Fig. 11D
METHOD CORE

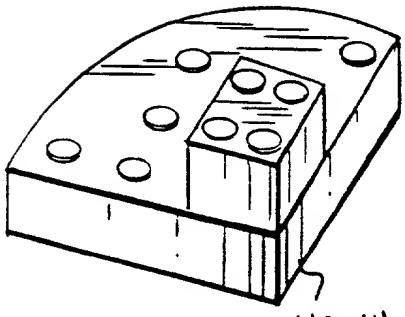


Fig. 11E
LOAD MODULE
WITH DTD

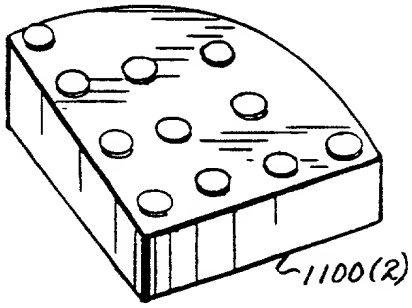


Fig. 11F
LOAD MODULE

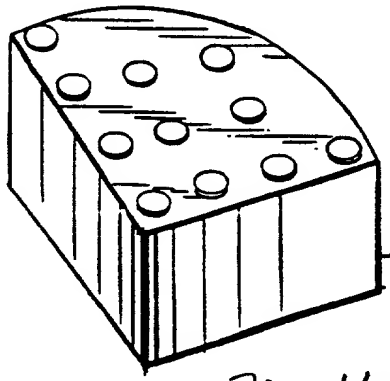


Fig 11G LOAD MODULE

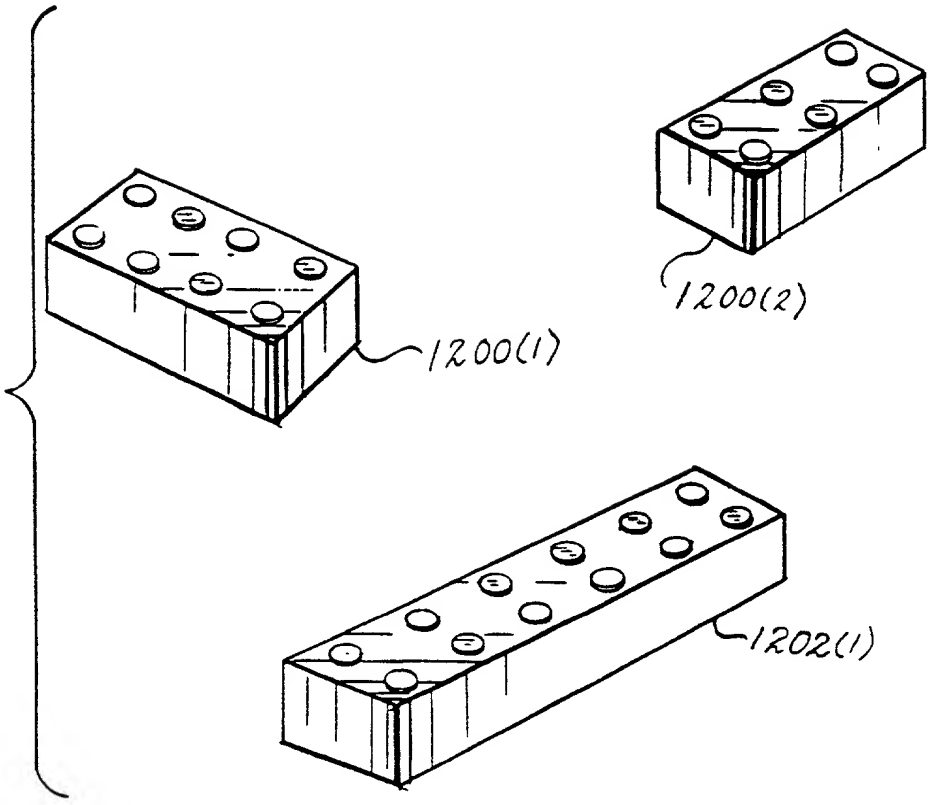


Fig. 11H.

DATA STRUCTURES

Fig. 11I

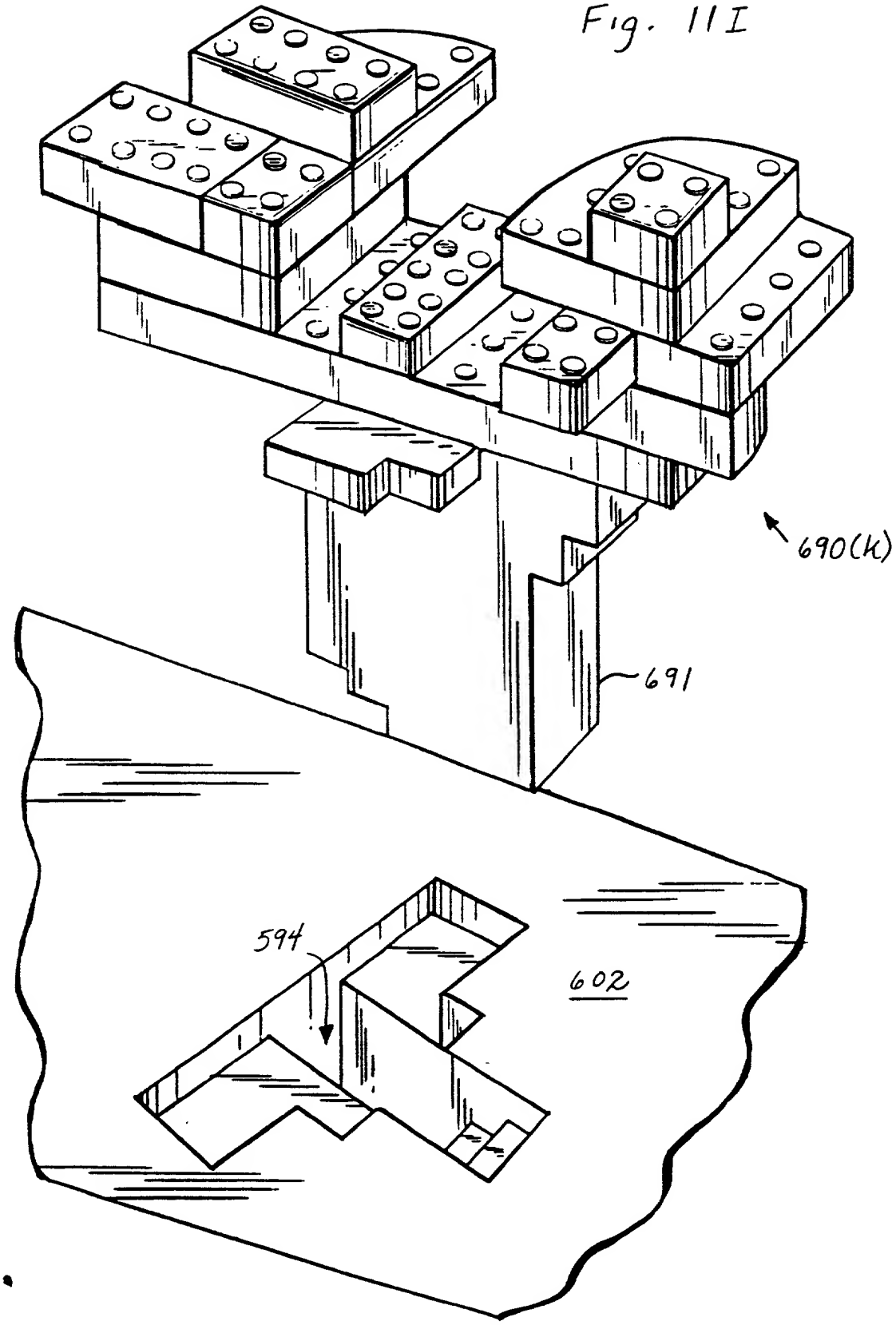


Fig. 11J

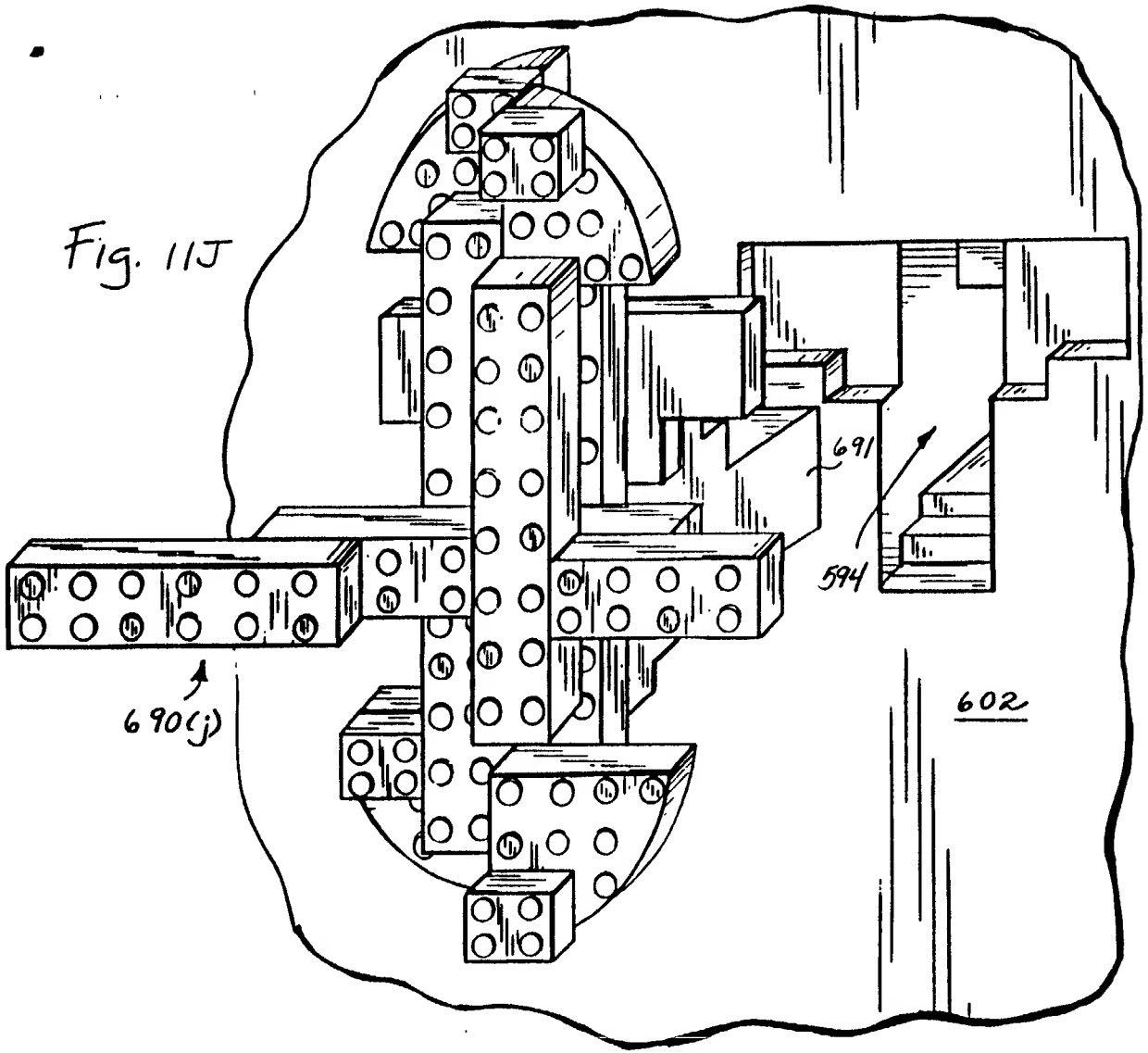


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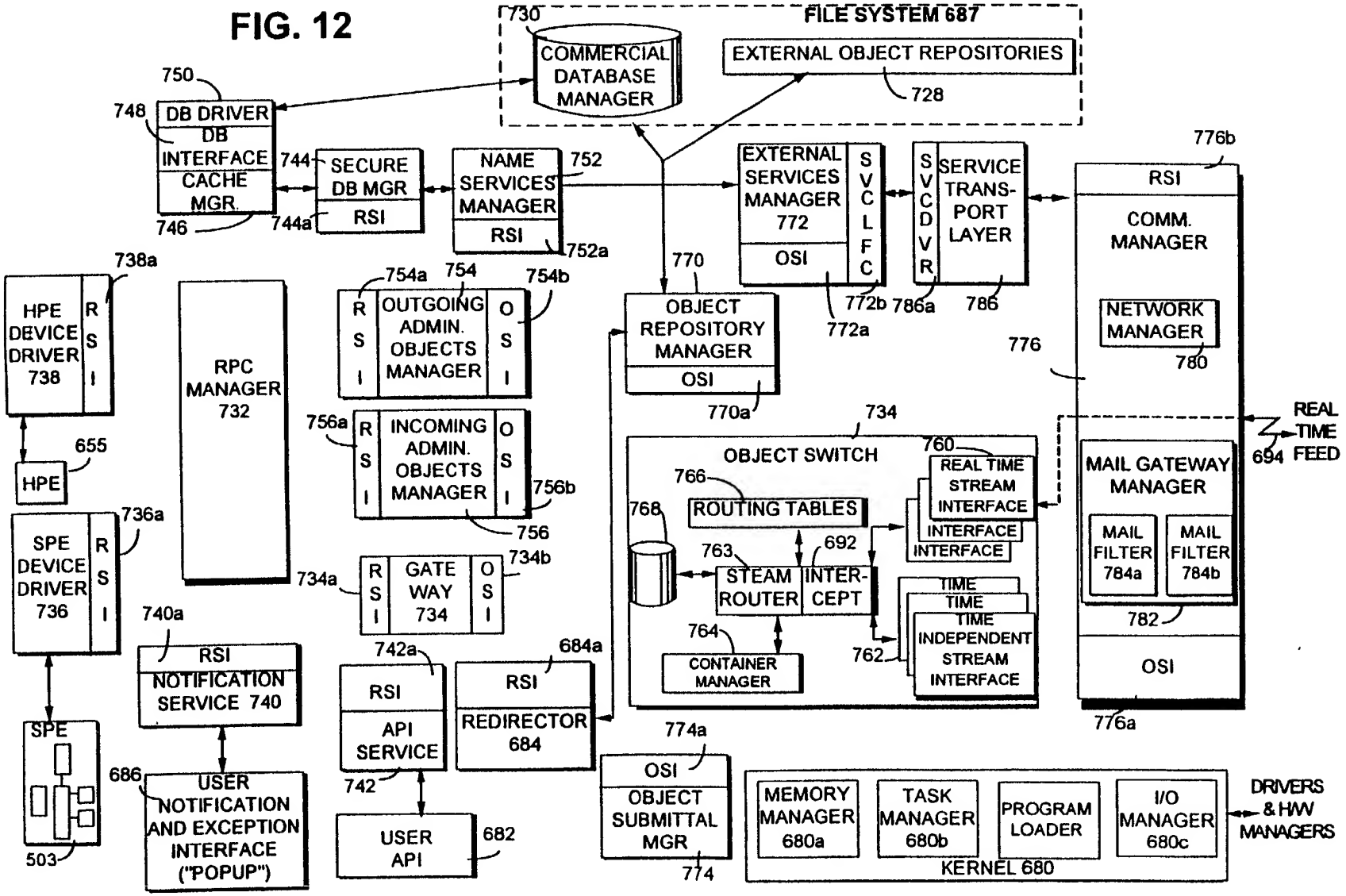
FIG. 12



Adobe Document Services

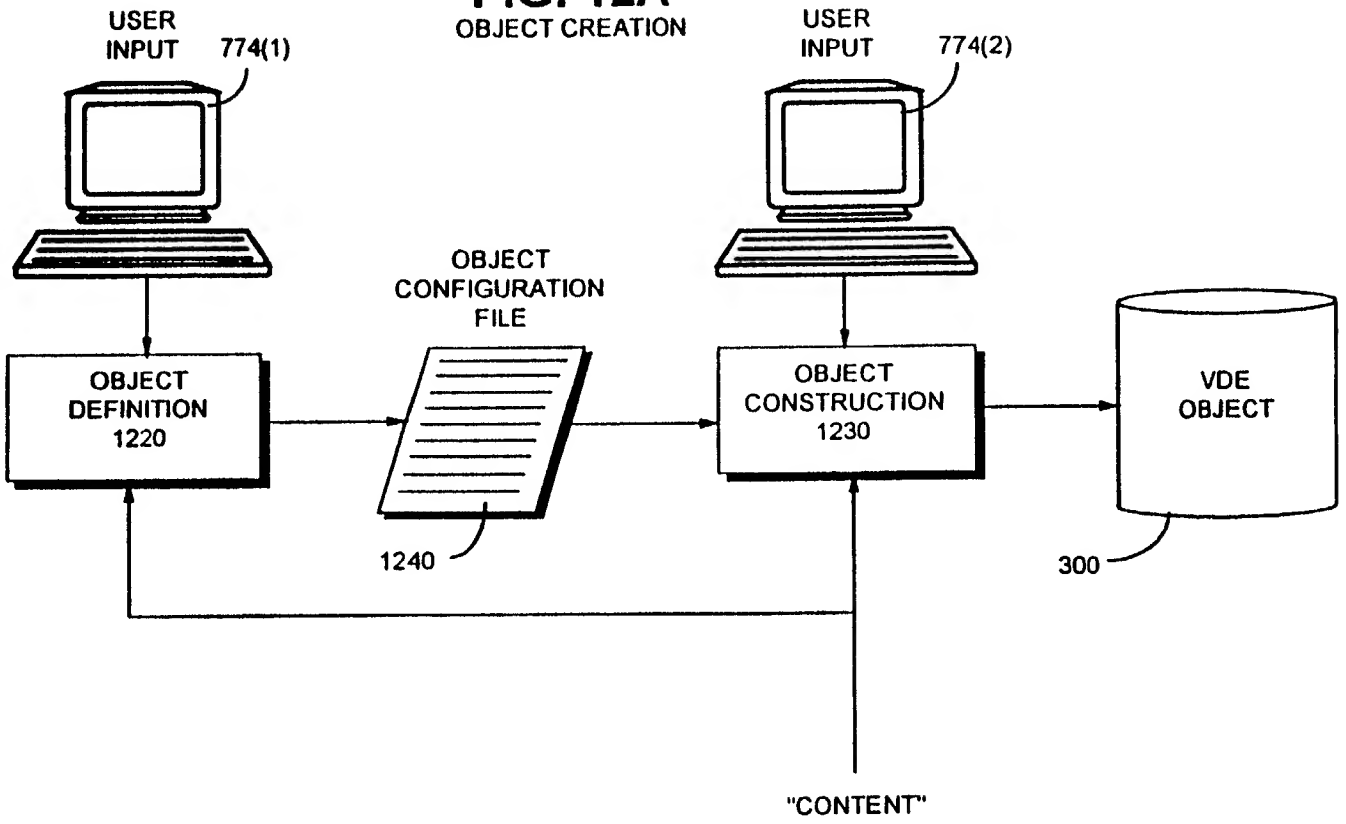
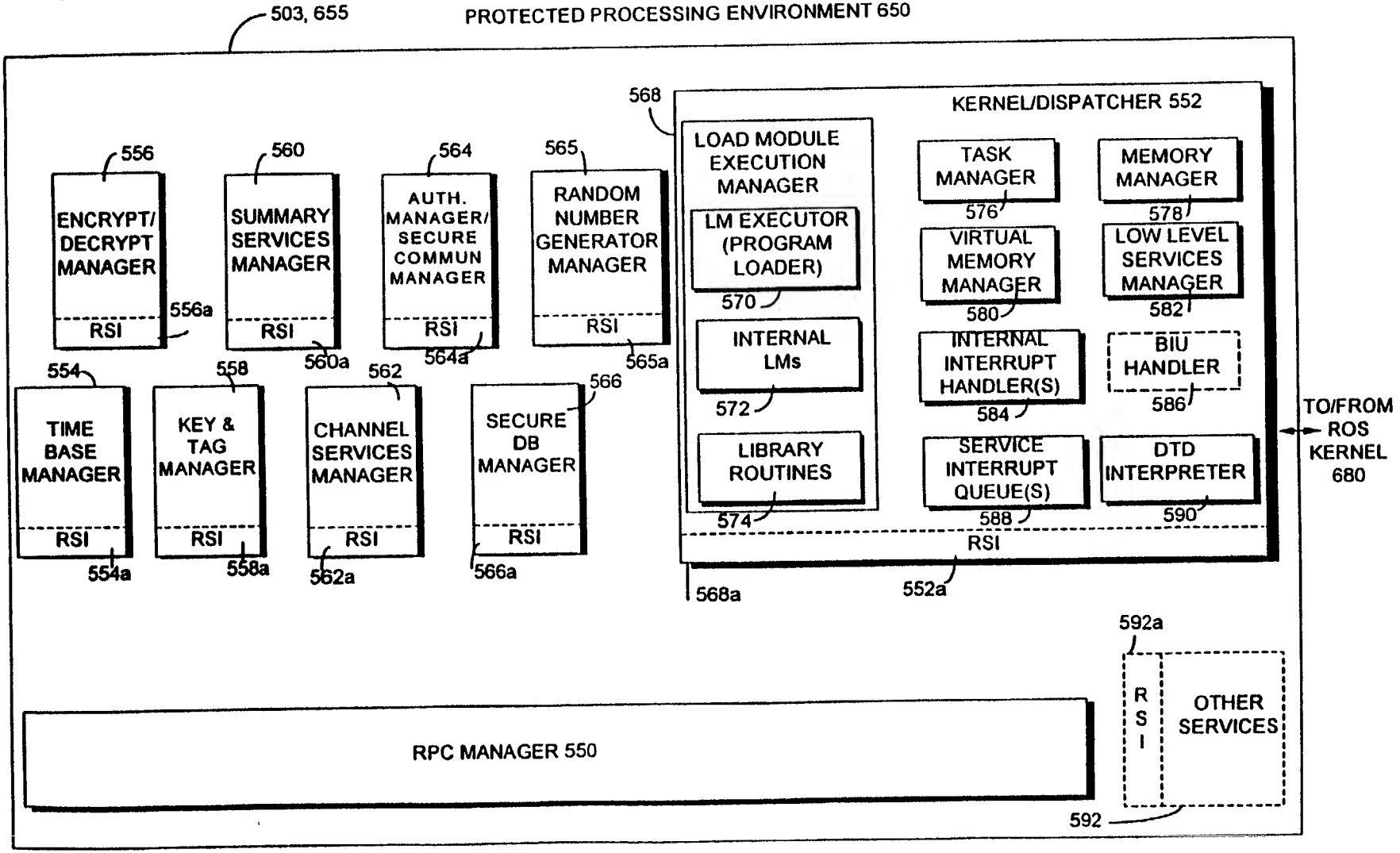


FIG. 12A
OBJECT CREATION

Protected Processing

FIG. 13



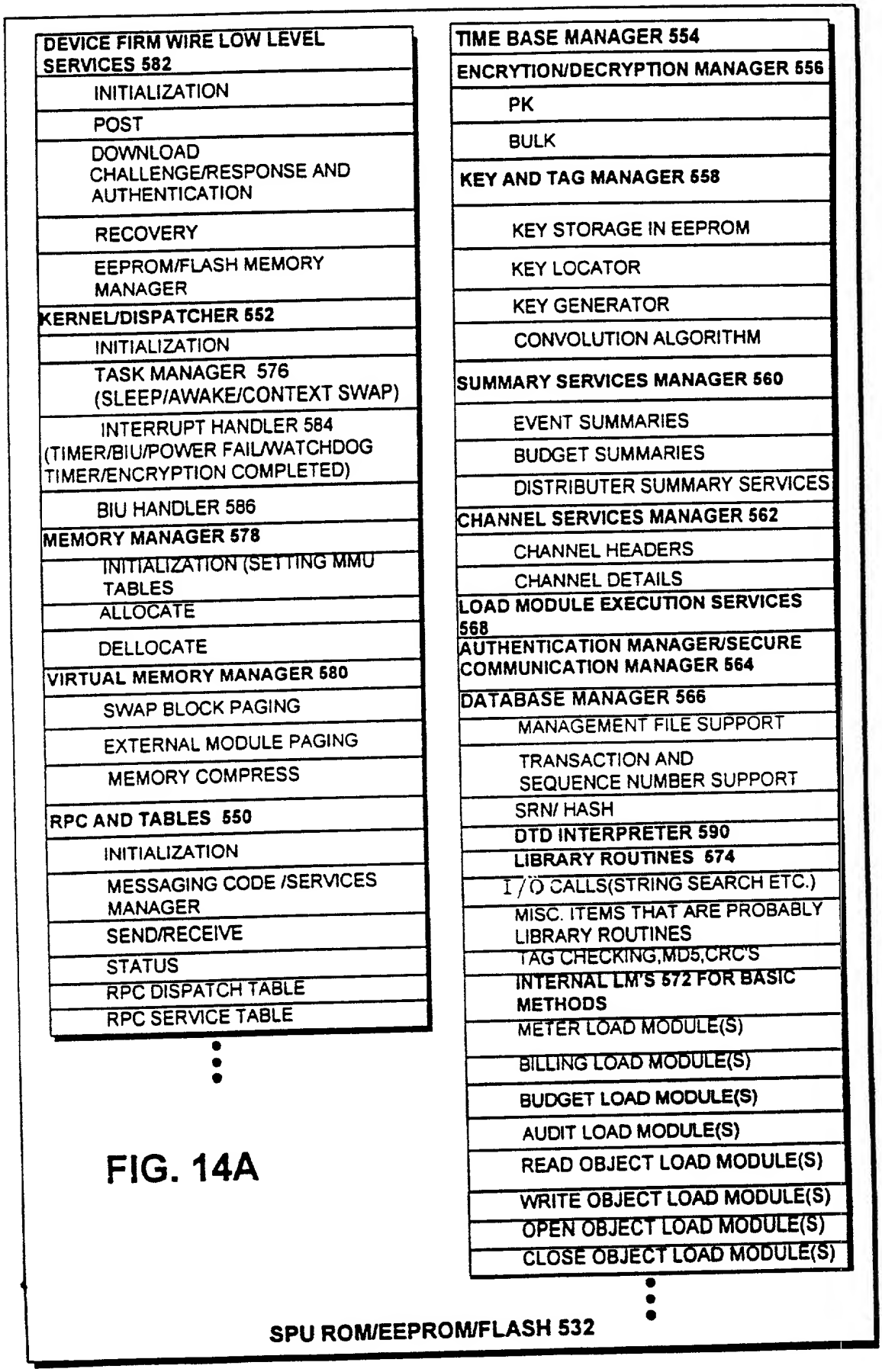

DEVICE FIRM WIRE LOW LEVEL SERVICES 582
INITIALIZATION
POST
DOWNLOAD CHALLENGE/RESPONSE AND AUTHENTICATION
RECOVERY
EEPROM/FLASH MEMORY MANAGER
KERNEL/DISPATCHER 552
INITIALIZATION
TASK MANAGER 576 (SLEEP/AWAKE/CONTEXT SWAP)
INTERRUPT HANDLER 584 (TIMER/BIU/POWER FAIL/WATCHDOG TIMER/ENCRYPTION COMPLETED)
BIU HANDLER 586
MEMORY MANAGER 578
INITIALIZATION (SETTING MMU TABLES
ALLOCATE
DELLOCATE
VIRTUAL MEMORY MANAGER 580
SWAP BLOCK PAGING
EXTERNAL MODULE PAGING
MEMORY COMPRESS
RPC AND TABLES 550
INITIALIZATION
MESSAGING CODE /SERVICES MANAGER
SEND/RECEIVE
STATUS
RPC DISPATCH TABLE
RPC SERVICE TABLE
TIME BASE MANAGER 554
ENCRYTION/DECRYPTION MANAGER 556
PK
BULK
KEY AND TAG MANAGER 558
KEY STORAGE IN EEPROM
KEY LOCATOR
KEY GENERATOR
CONVOLUTION ALGORITHM
SUMMARY SERVICES MANAGER 560
EVENT SUMMARIES
BUDGET SUMMARIES
DISTRIBUTER SUMMARY SERVICES
CHANNEL SERVICES MANAGER 562
CHANNEL HEADERS
CHANNEL DETAILS
LOAD MODULE EXECUTION SERVICES 568
AUTHENTICATION MANAGER/SECURE COMMUNICATION MANAGER 564
DATABASE MANAGER 566
MANAGEMENT FILE SUPPORT
TRANSACTION AND SEQUENCE NUMBER SUPPORT
SRN/ HASH
DTD INTERPRETER 590
LIBRARY ROUTINES 574
I/O CALLS(STRING SEARCH ETC.)
MISC. ITEMS THAT ARE PROBABLY LIBRARY ROUTINES
TAG CHECKING,MD5,CRC'S
INTERNAL LM'S 572 FOR BASIC METHODS
METER LOAD MODULE(S)
BILLING LOAD MODULE(S)
BUDGET LOAD MODULE(S)
AUDIT LOAD MODULE(S)
READ OBJECT LOAD MODULE(S)
WRITE OBJECT LOAD MODULE(S)
OPEN OBJECT LOAD MODULE(S)
CLOSE OBJECT LOAD MODULE(S)
SPU ROM/EEPROM/FLASH 532

FIG. 14A

FIG. 14B

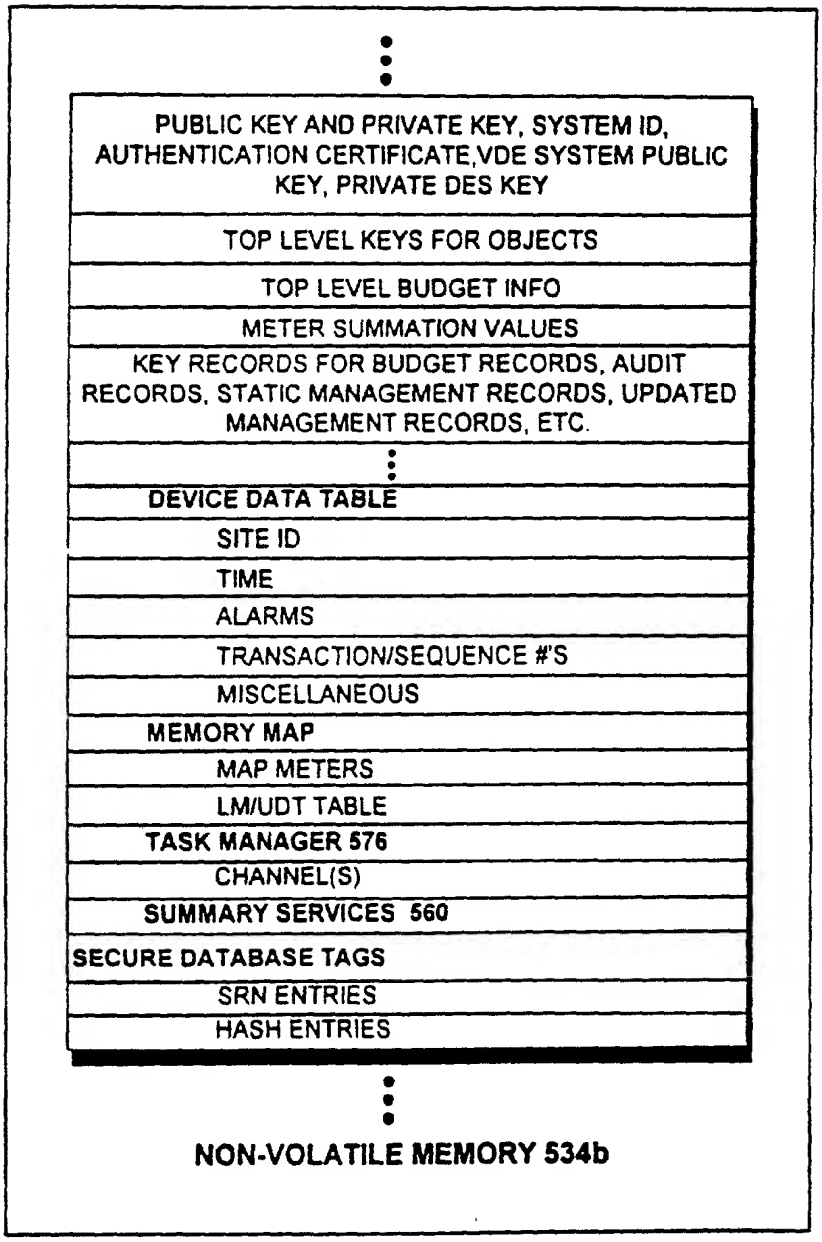
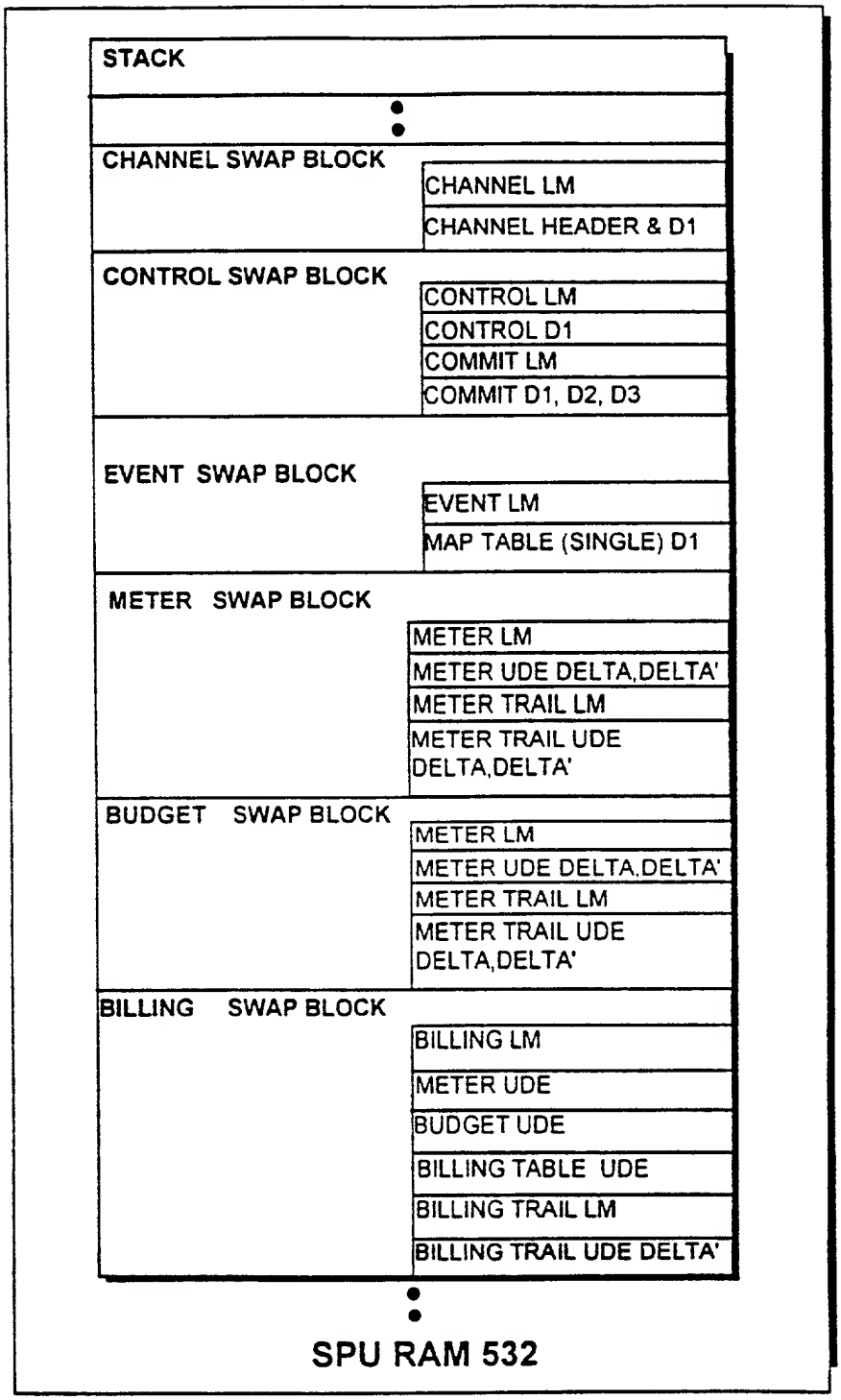

PUBLIC KEY AND PRIVATE KEY, SYSTEM ID, AUTHENTICATION CERTIFICATE,VDE SYSTEM PUBLIC KEY, PRIVATE DES KEY
TOP LEVEL KEYS FOR OBJECTS
TOP LEVEL BUDGET INFO
METER SUMMATION VALUES
KEY RECORDS FOR BUDGET RECORDS, AUDIT RECORDS, STATIC MANAGEMENT RECORDS, UPDATED MANAGEMENT RECORDS, ETC.
DEVICE DATA TABLE
SITE ID
TIME
ALARMS
TRANSACTION/SEQUENCE #'S
MISCELLANEOUS
MEMORY MAP
MAP METERS
LM/UDT TABLE
TASK MANAGER 576
CHANNEL(S)
SUMMARY SERVICES 560
SECURE DATABASE TAGS
SRN ENTRIES
HASH ENTRIES
NON-VOLATILE MEMORY 534b

FIG. 14C


STACK
CHANNEL SWAP BLOCK
CHANNEL LM
CHANNEL HEADER & D1
CONTROL SWAP BLOCK
CONTROL LM
CONTROL D1
COMMIT LM
COMMIT D1, D2, D3
EVENT SWAP BLOCK
EVENT LM
MAP TABLE (SINGLE) D1
METER SWAP BLOCK
METER LM
METER UDE DELTA,DELTA'
METER TRAIL LM
METER TRAIL UDE DELTA,DELTA'
BUDGET SWAP BLOCK
METER LM
METER UDE DELTA,DELTA'
METER TRAIL LM
METER TRAIL UDE DELTA,DELTA'
BILLING SWAP BLOCK
BILLING LM
METER UDE
BUDGET UDE
BILLING TABLE UDE
BILLING TRAIL LM
BILLING TRAIL UDE DELTA'
SPU RAM 532

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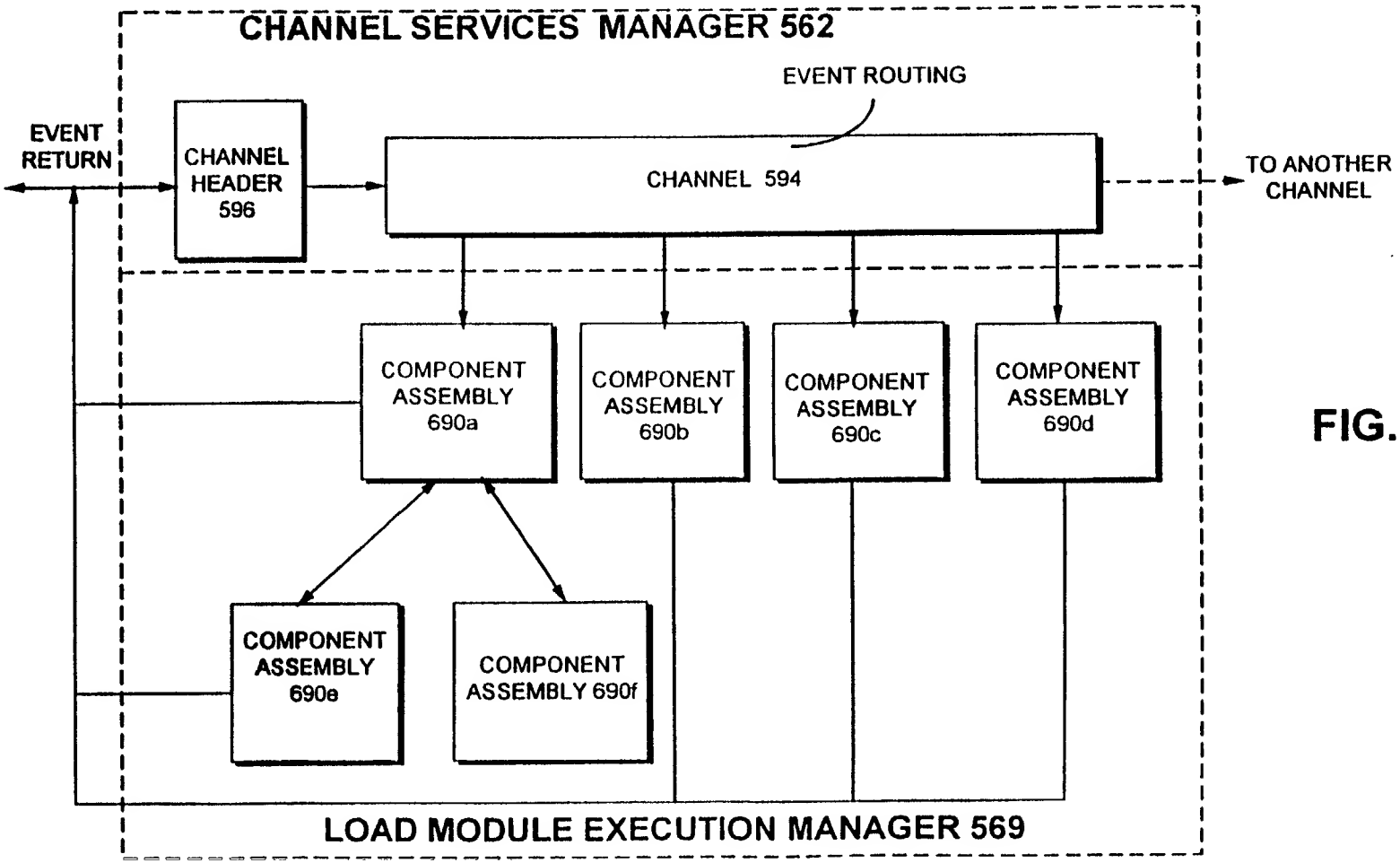


FIG. 15

FIG. 15A

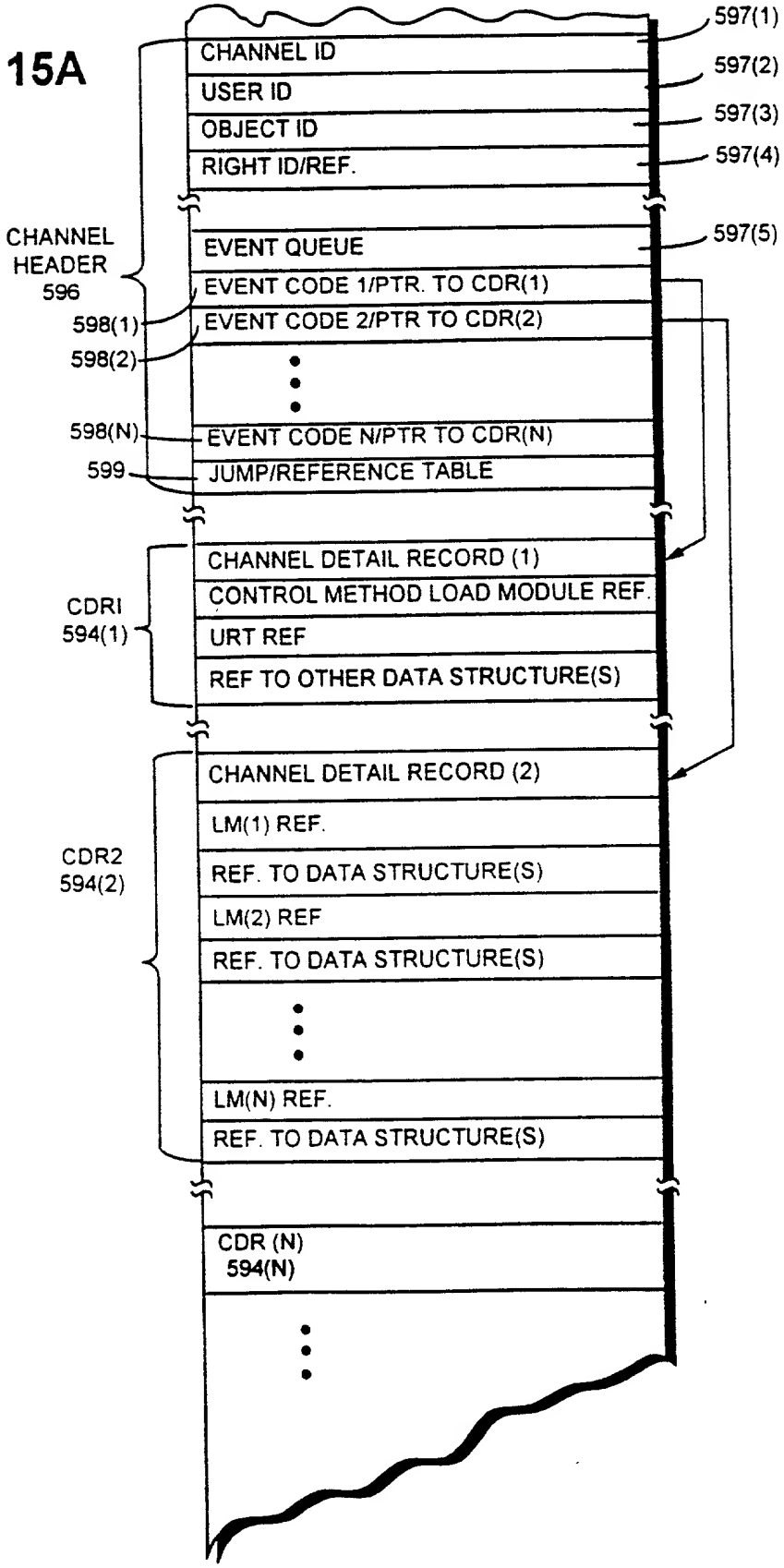

CHANNEL ID
USER ID
OBJECT ID
RIGHT ID/REF.
597(1)
597(2)
597(3)
597(4)
CHANNEL HEADER 596
EVENT QUEUE
597(5)
EVENT CODE 1/PTR. TO CDR(1)
598(1)
EVENT CODE 2/PTR TO CDR(2)
598(2)
598(N)
EVENT CODE N/PTR TO CDR(N)
599
JUMP/REFERENCE TABLE
CDRI 594(1)
CHANNEL DETAIL RECORD (1)
CONTROL METHOD LOAD MODULE REF.
URT REF
REF TO OTHER DATA STRUCTURE(S)
CDR2 594(2)
CHANNEL DETAIL RECORD (2)
LM(1) REF.
REF. TO DATA STRUCTURE(S)
LM(2) REF
REF. TO DATA STRUCTURE(S)
LM(N) REF.
REF. TO DATA STRUCTURE(S)
CDR (N) 594(N)

FIG. 15B

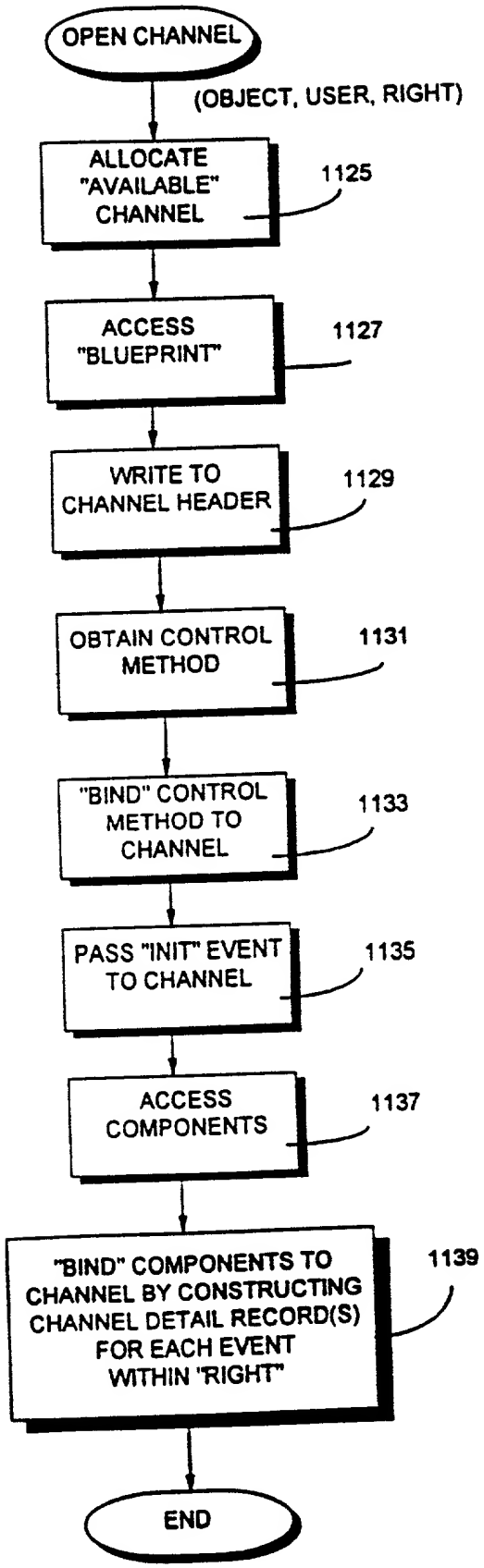
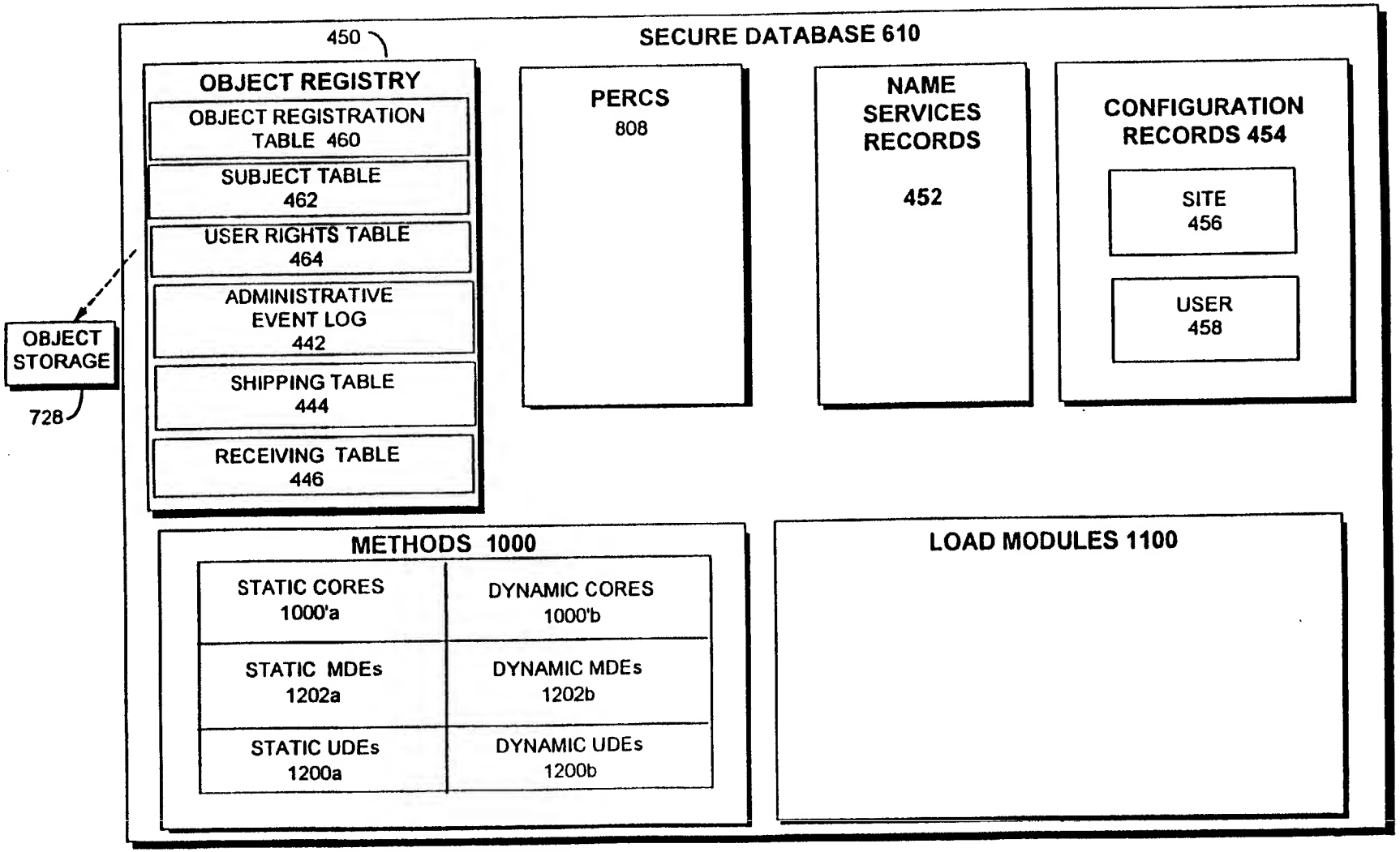

OPEN CHANNEL
(OBJECT, USER, RIGHT)
ALLOCATE "AVAILABLE" CHANNEL
1125
ACCESS "BLUEPRINT"
1127
WRITE TO CHANNEL HEADER
1129
OBTAIN CONTROL METHOD
1131
"BIND" CONTROL METHOD TO CHANNEL
1133
PASS "INIT" EVENT TO CHANNEL
1135
ACCESS COMPONENTS
1137
"BIND" COMPONENTS TO CHANNEL BY CONSTRUCTING CHANNEL DETAIL RECORD(S) FOR EACH EVENT WITHIN "RIGHT"
1139
END

FIG. 16


450
SECURE DATABASE 610
OBJECT REGISTRY
OBJECT REGISTRATION TABLE 460
SUBJECT TABLE 462
USER RIGHTS TABLE 464
ADMINISTRATIVE EVENT LOG 442
SHIPPING TABLE 444
RECEIVING TABLE 446
OBJECT STORAGE
728
PERCS 808
NAME SERVICES RECORDS 452
CONFIGURATION RECORDS 454
SITE 456
USER 458
METHODS 1000
STATIC CORES 1000'a
DYNAMIC CORES 1000'b
STATIC MDEs 1202a
DYNAMIC MDEs 1202b
STATIC UDEs 1200a
DYNAMIC UDEs 1200b
LOAD MODULES 1100

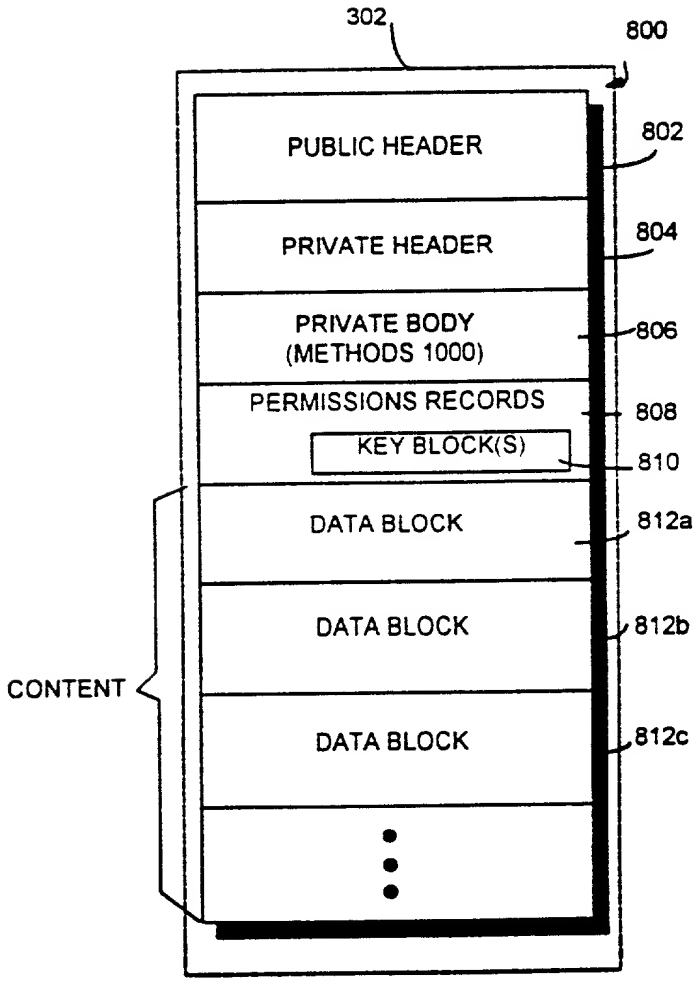
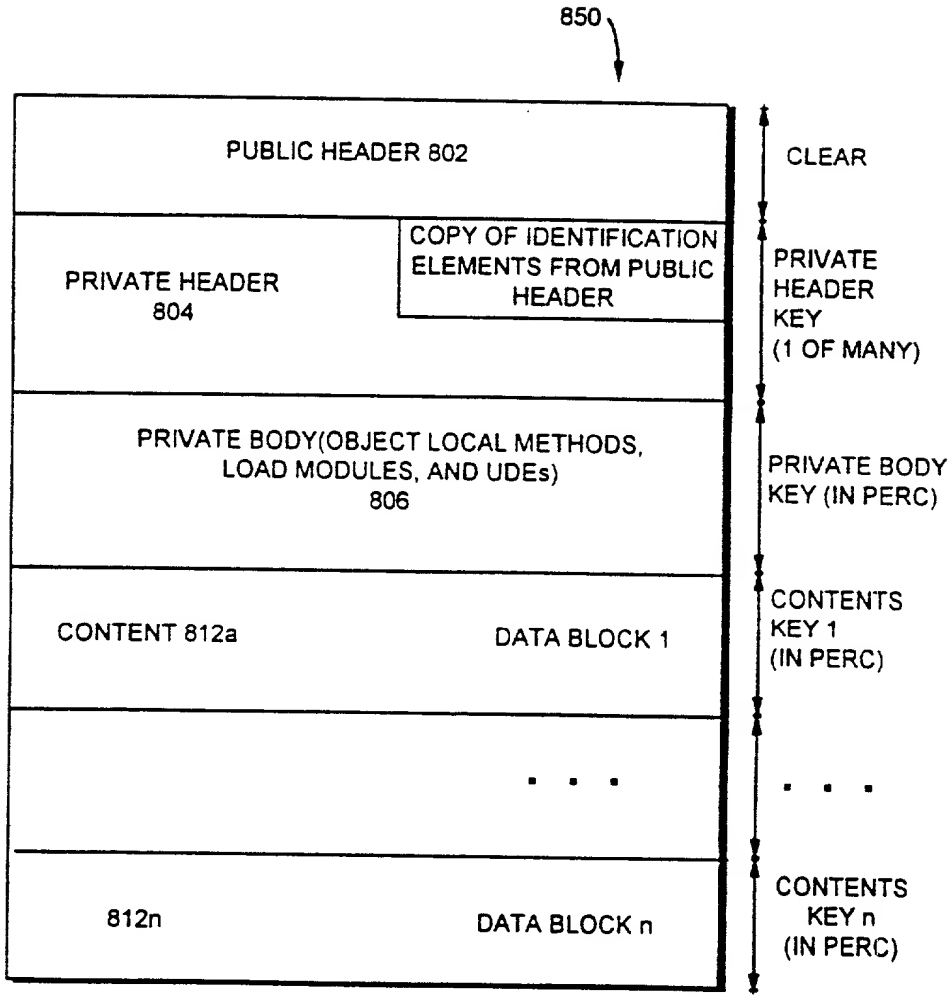
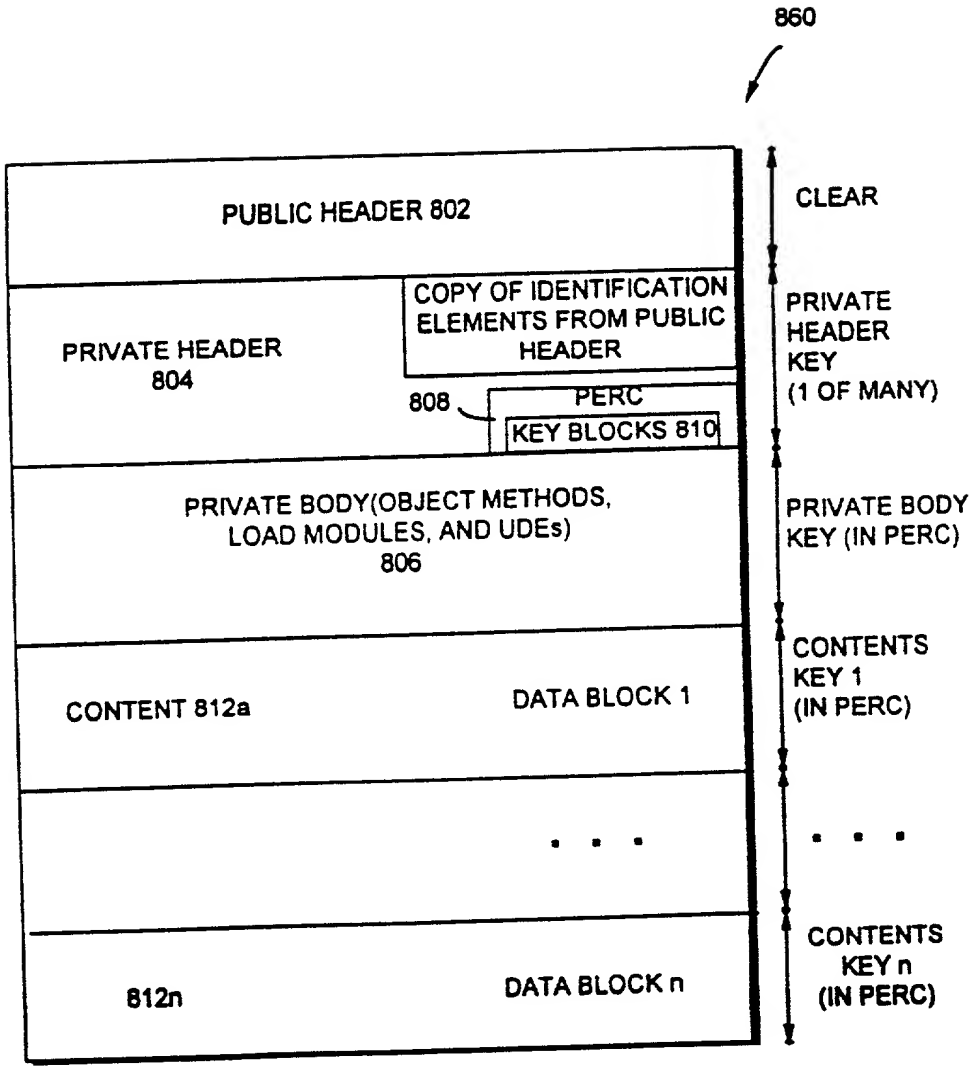

302
800
PUBLIC HEADER
802
PRIVATE HEADER
804
PRIVATE BODY
(METHODS 1000)
806
PERMISSIONS RECORDS
808
KEY BLOCK(S)
810
DATA BLOCK
812a
DATA BLOCK
812b
DATA BLOCK
812c
CONTENT
LOGICAL OBJECT

FIG. 17



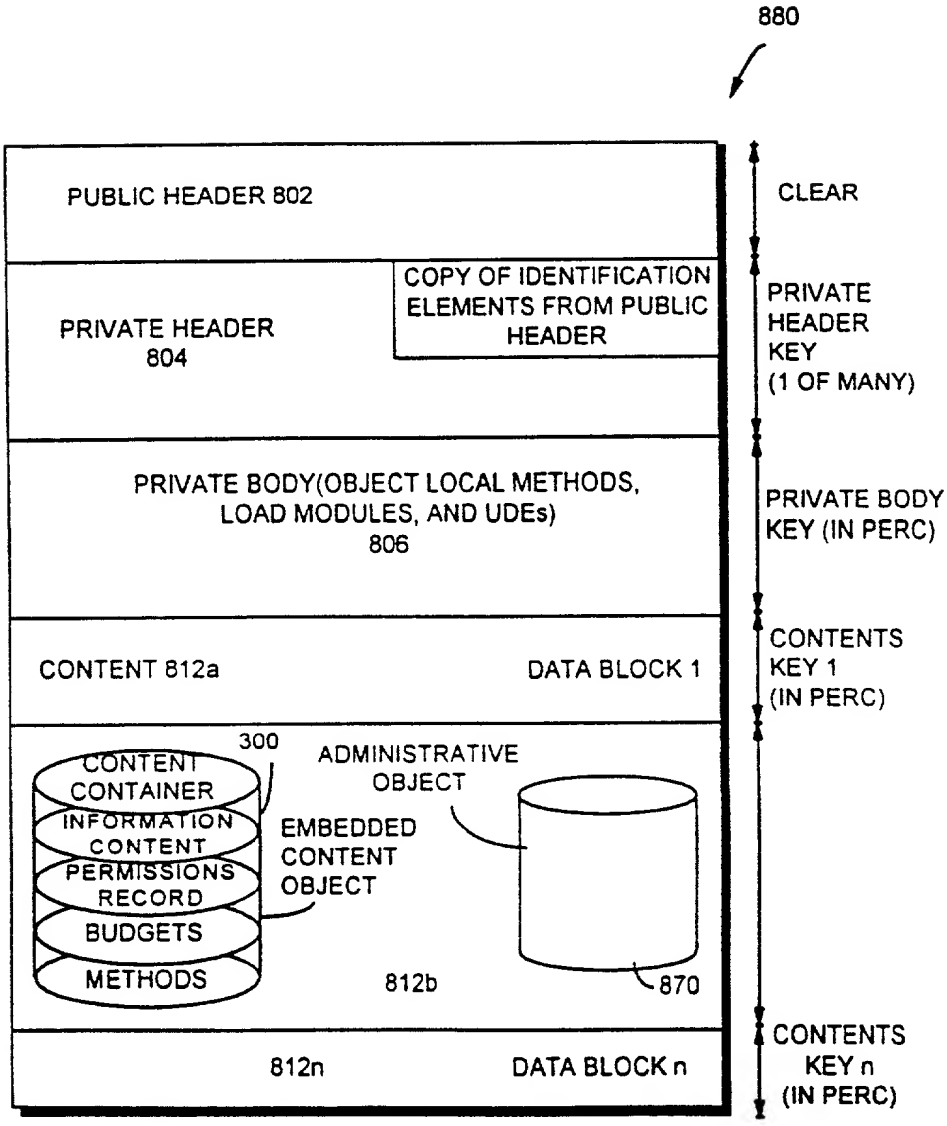
STATIONARY OBJECT

FIG. 18



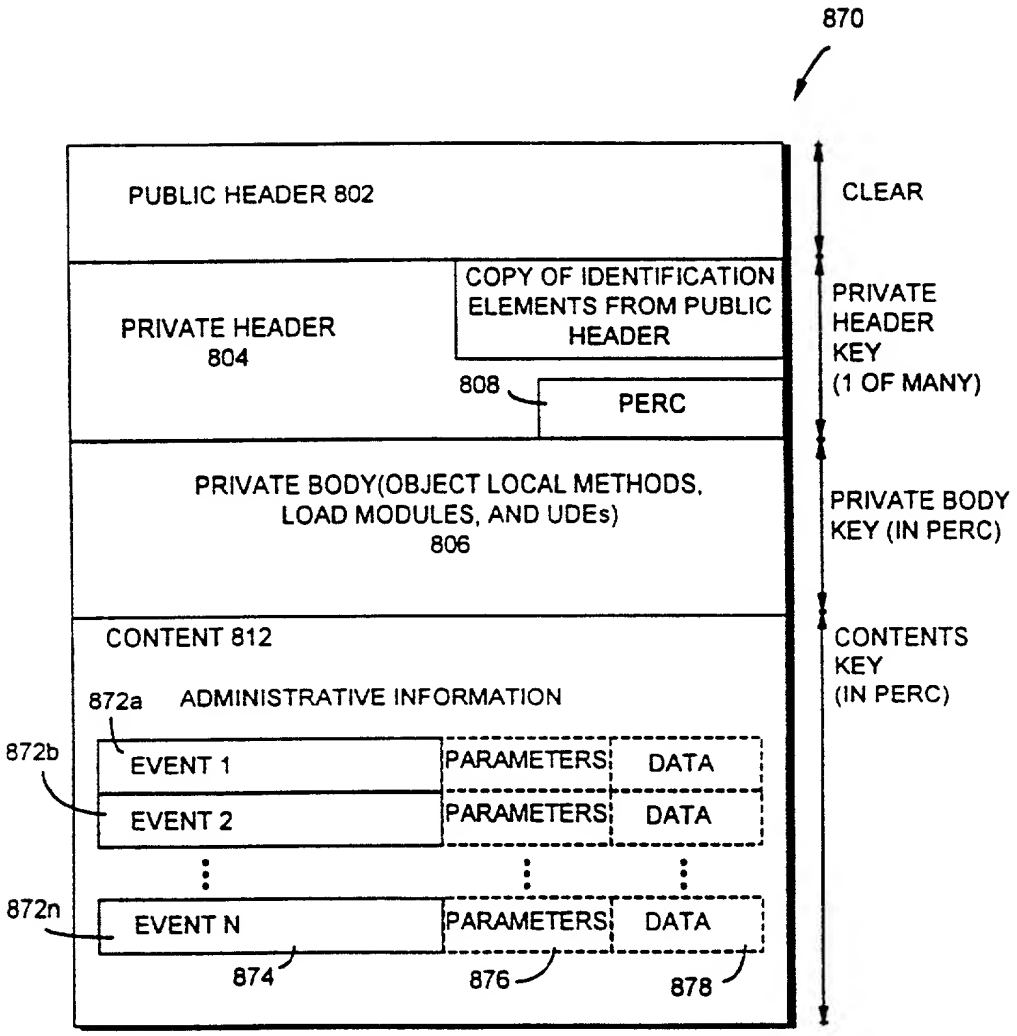
TRAVELING OBJECT

FIG. 19



CONTENT OBJECT

FIG. 20



ADMINISTRATIVE OBJECT

FIG. 21

FIG. 22

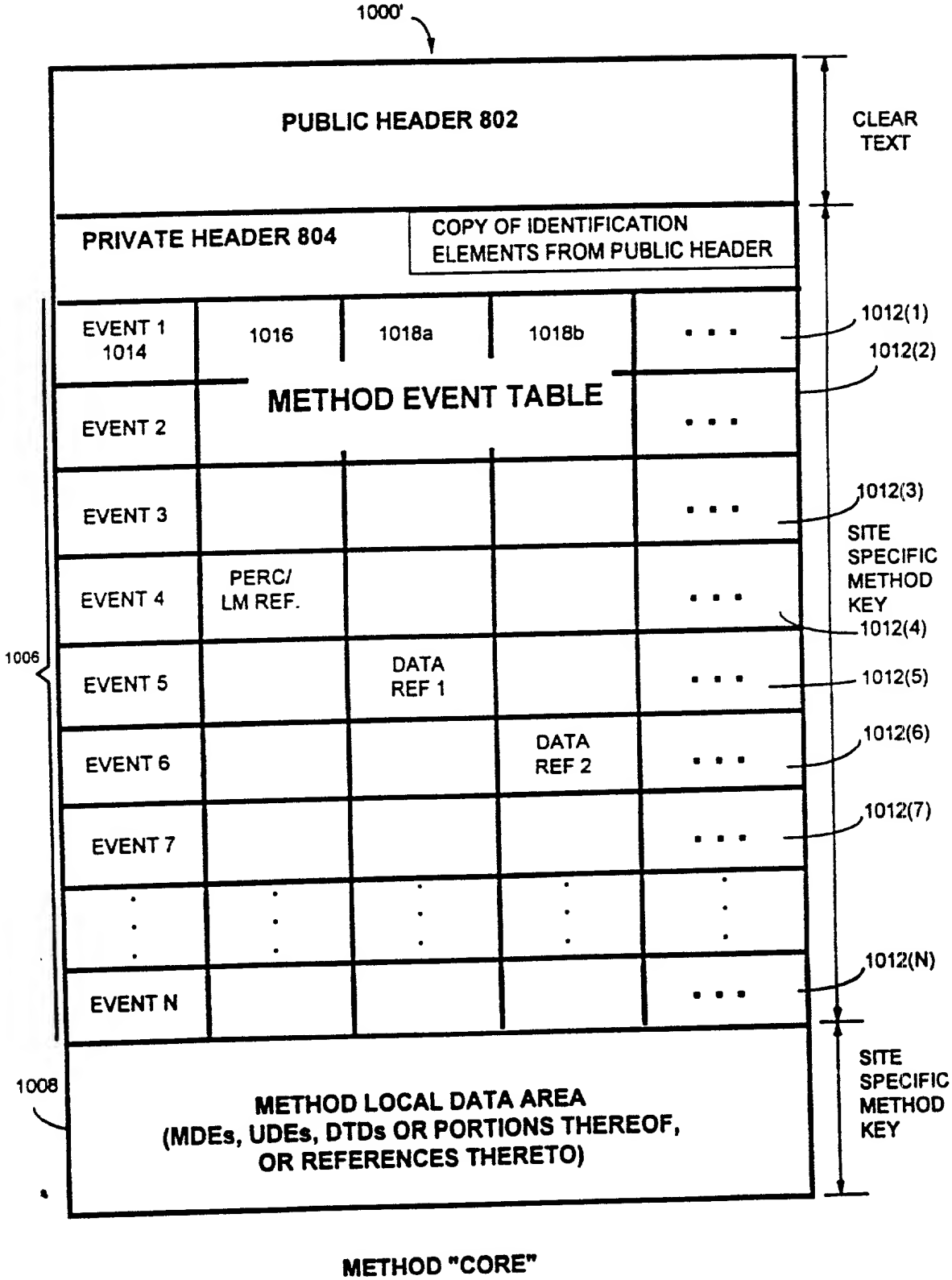
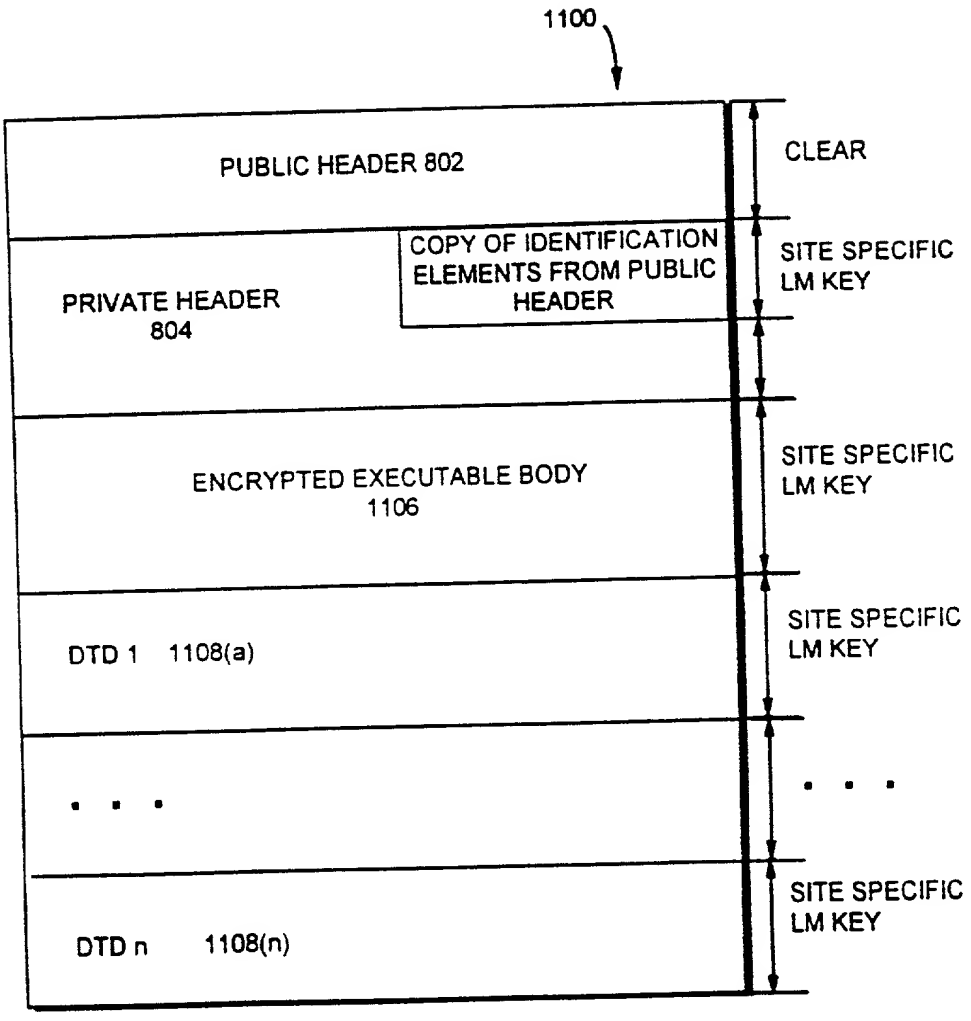
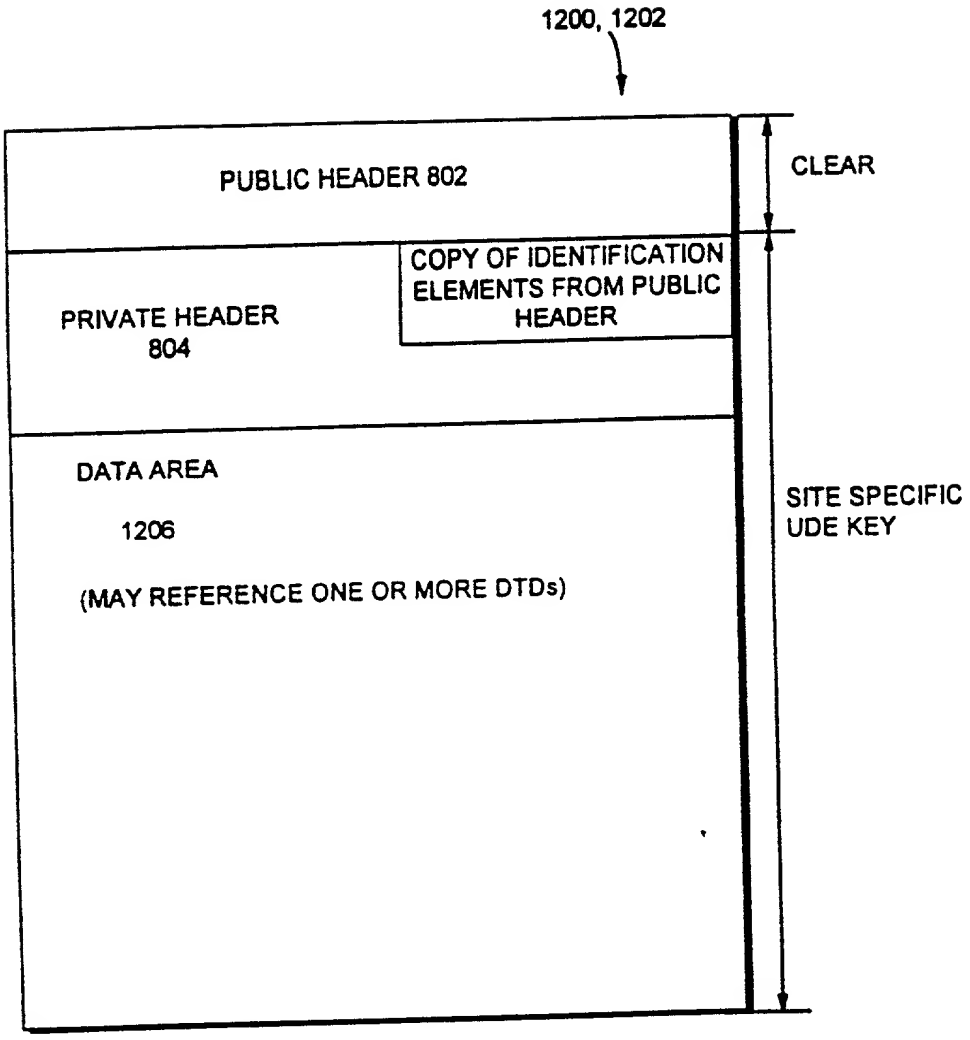

1000'
PUBLIC HEADER 802
CLEAR TEXT
PRIVATE HEADER 804
COPY OF IDENTIFICATION ELEMENTS FROM PUBLIC HEADER
EVENT 1 1014
1016
1018a
1018b
METHOD EVENT TABLE
1012(1)
1012(2)
EVENT 2
EVENT 3
1012(3)
SITE SPECIFIC METHOD KEY
EVENT 4
PERC/ LM REF.
1012(4)
1006
EVENT 5
DATA REF 1
1012(5)
EVENT 6
DATA REF 2
1012(6)
EVENT 7
1012(7)
EVENT N
1012(N)
1008
METHOD LOCAL DATA AREA
(MDEs, UDEs, DTDs OR PORTIONS THEREOF, OR REFERENCES THERETO)
SITE SPECIFIC METHOD KEY
METHOD "CORE"

FIG. 23



LOAD MODULE

FIG. 24



UDE (MDE)

FIG. 25A

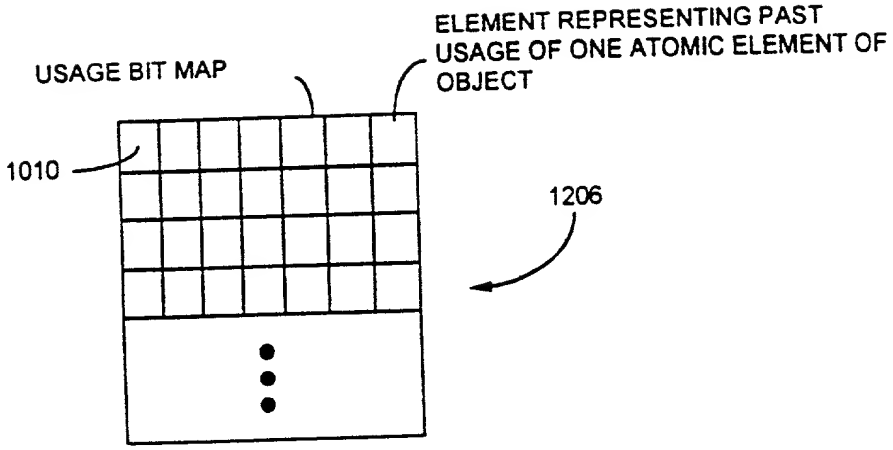


FIG. 25B

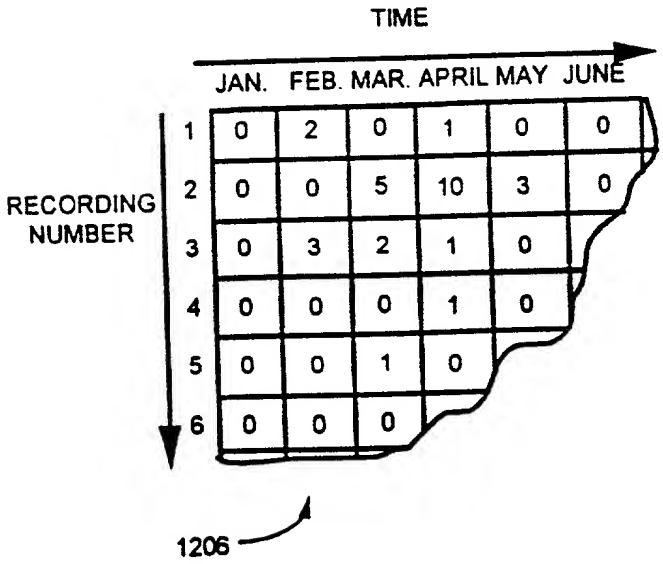


FIG. 25C

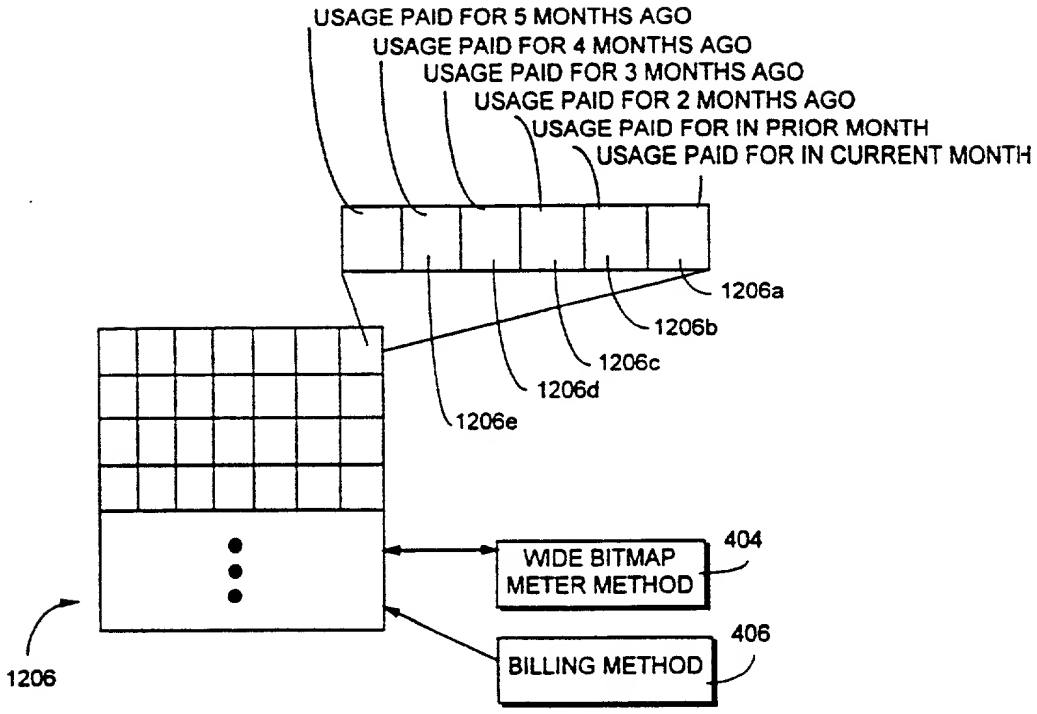

USAGE PAID FOR 5 MONTHS AGO
USAGE PAID FOR 4 MONTHS AGO
USAGE PAID FOR 3 MONTHS AGO
USAGE PAID FOR 2 MONTHS AGO
USAGE PAID FOR IN PRIOR MONTH
USAGE PAID FOR IN CURRENT MONTH
1206a
1206b
1206c
1206d
1206e
WIDE BITMAP METER METHOD
404
BILLING METHOD
406
1206

FIG. 25C

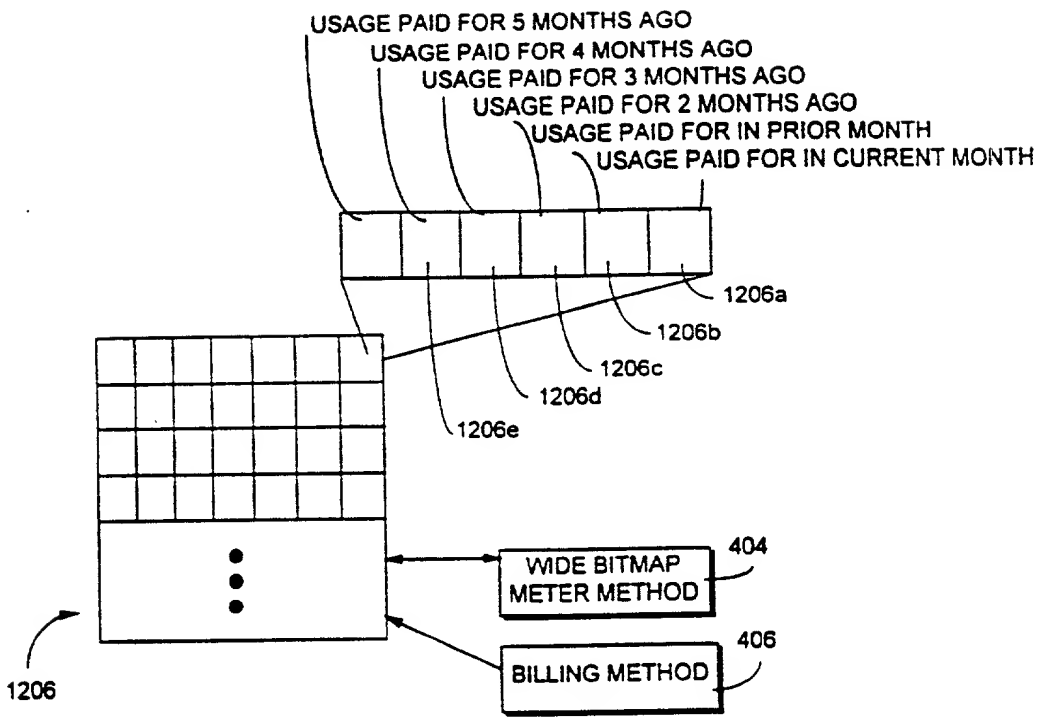

USAGE PAID FOR 5 MONTHS AGO
USAGE PAID FOR 4 MONTHS AGO
USAGE PAID FOR 3 MONTHS AGO
USAGE PAID FOR 2 MONTHS AGO
USAGE PAID FOR IN PRIOR MONTH
USAGE PAID FOR IN CURRENT MONTH
1206a
1206b
1206c
1206d
1206e
WIDE BITMAP METER METHOD
404
BILLING METHOD
406
1206

FIG. 26

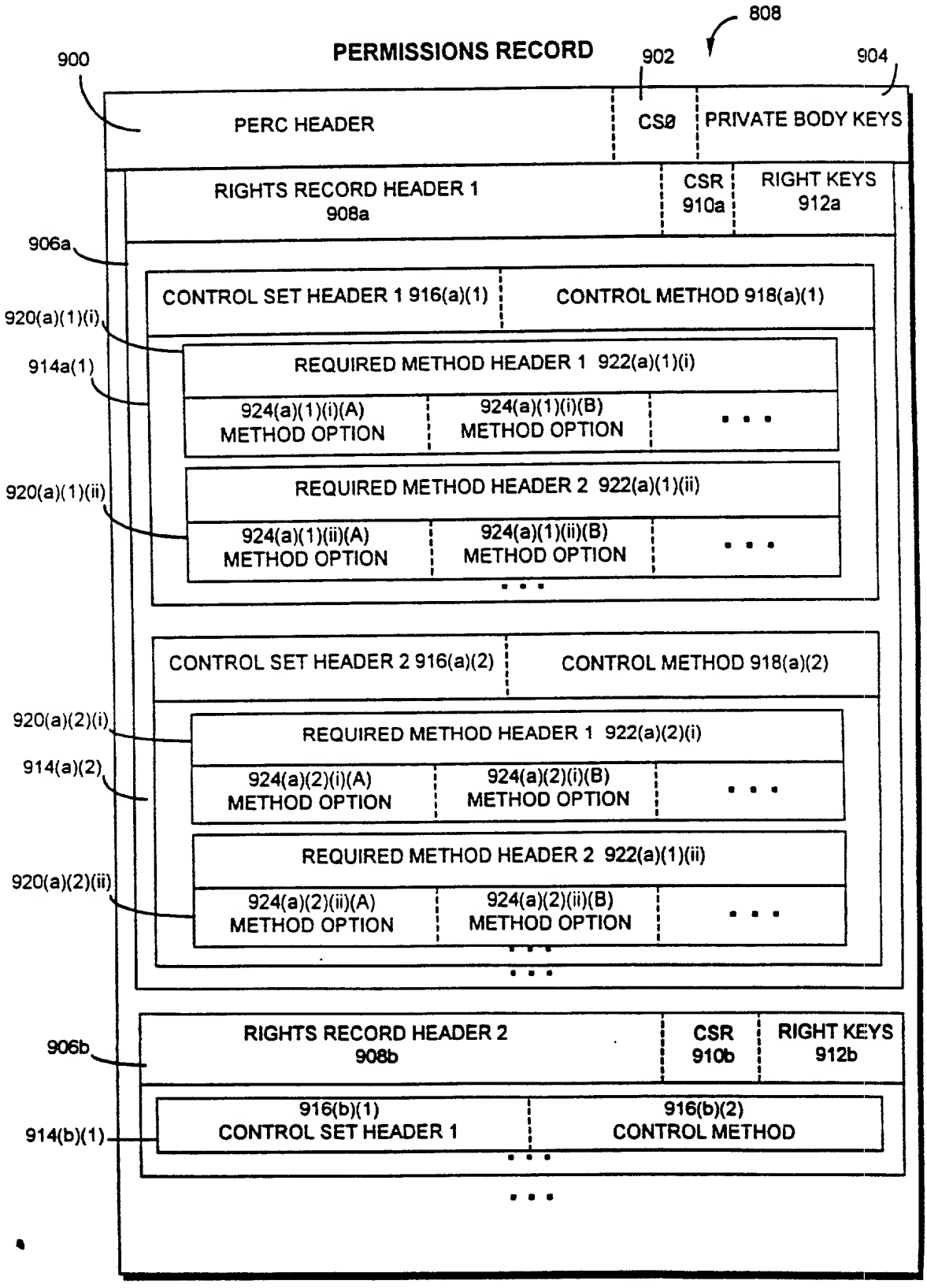

808
PERMISSIONS RECORD
900
902
904
PERC HEADER
CSØ
PRIVATE BODY KEYS
RIGHTS RECORD HEADER 1
908a
CSR
910a
RIGHT KEYS
912a
906a
CONTROL SET HEADER 1 916(a)(1)
CONTROL METHOD 918(a)(1)
920(a)(1)(i)
914a(1)
REQUIRED METHOD HEADER 1 922(a)(1)(i)
924(a)(1)(i)(A)
METHOD OPTION
924(a)(1)(i)(B)
METHOD OPTION
920(a)(1)(ii)
REQUIRED METHOD HEADER 2 922(a)(1)(ii)
924(a)(1)(ii)(A)
METHOD OPTION
924(a)(1)(ii)(B)
METHOD OPTION
CONTROL SET HEADER 2 916(a)(2)
CONTROL METHOD 918(a)(2)
920(a)(2)(i)
914(a)(2)
REQUIRED METHOD HEADER 1 922(a)(2)(i)
924(a)(2)(i)(A)
METHOD OPTION
924(a)(2)(i)(B)
METHOD OPTION
920(a)(2)(ii)
REQUIRED METHOD HEADER 2 922(a)(1)(ii)
924(a)(2)(ii)(A)
METHOD OPTION
924(a)(2)(ii)(B)
METHOD OPTION
906b
RIGHTS RECORD HEADER 2
908b
CSR
910b
RIGHT KEYS
912b
914(b)(1)
916(b)(1)
CONTROL SET HEADER 1
916(b)(2)
CONTROL METHOD

FIG. 26A

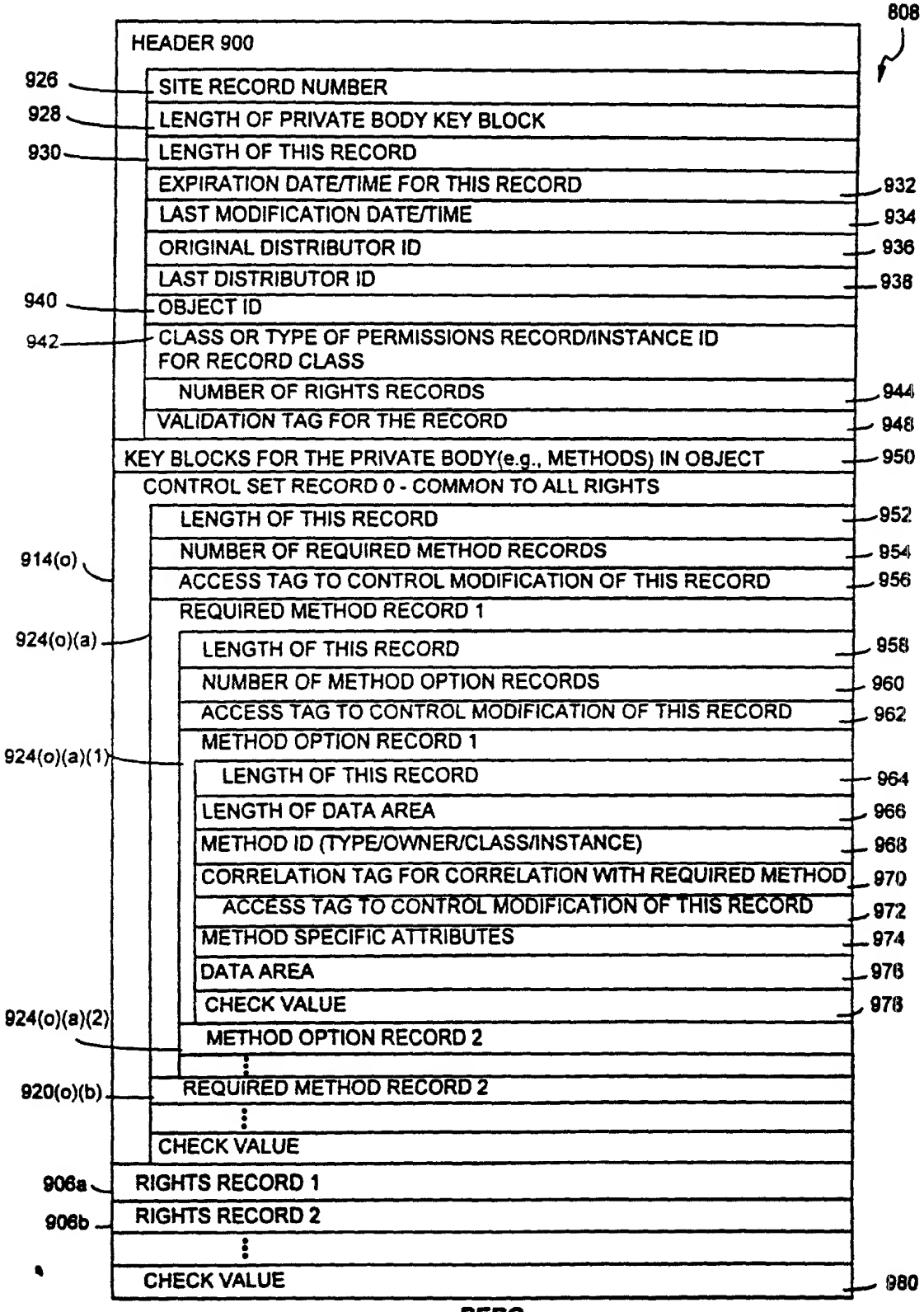
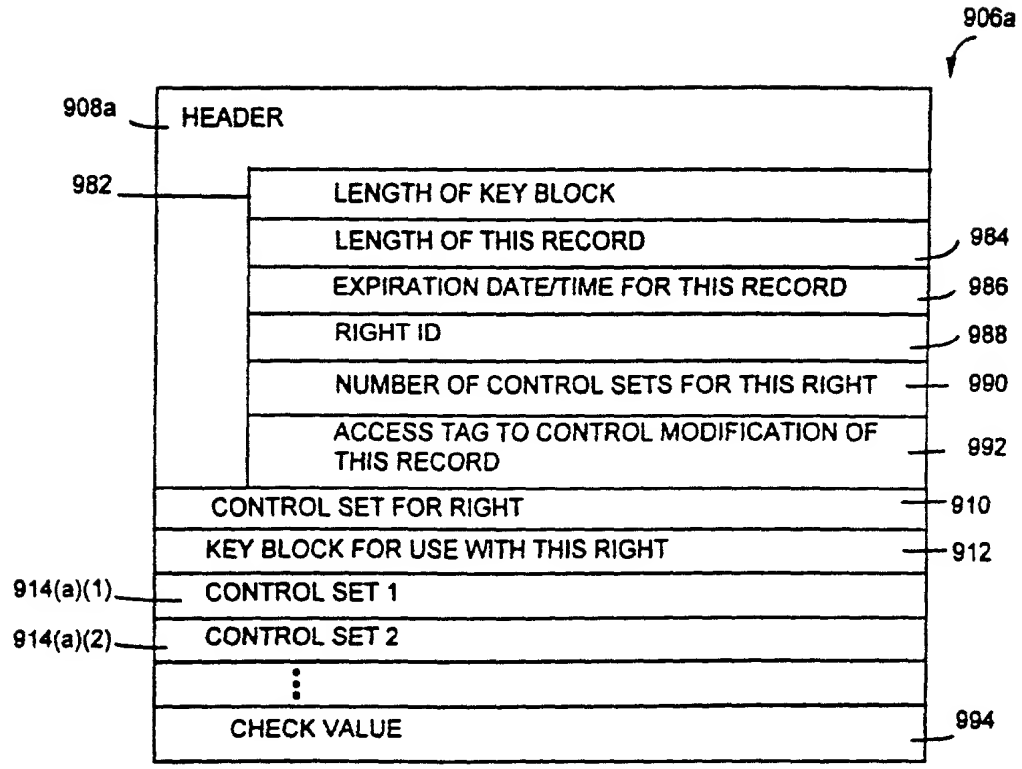

808
HEADER 900
926
SITE RECORD NUMBER
928
LENGTH OF PRIVATE BODY KEY BLOCK
930
LENGTH OF THIS RECORD
EXPIRATION DATE/TIME FOR THIS RECORD
932
LAST MODIFICATION DATE/TIME
934
ORIGINAL DISTRIBUTOR ID
936
LAST DISTRIBUTOR ID
938
940
OBJECT ID
942
CLASS OR TYPE OF PERMISSIONS RECORD/INSTANCE ID FOR RECORD CLASS
NUMBER OF RIGHTS RECORDS
944
VALIDATION TAG FOR THE RECORD
948
KEY BLOCKS FOR THE PRIVATE BODY(e.g., METHODS) IN OBJECT
950
CONTROL SET RECORD 0 - COMMON TO ALL RIGHTS
LENGTH OF THIS RECORD
952
914(o)
NUMBER OF REQUIRED METHOD RECORDS
954
ACCESS TAG TO CONTROL MODIFICATION OF THIS RECORD
956
REQUIRED METHOD RECORD 1
924(o)(a)
LENGTH OF THIS RECORD
958
NUMBER OF METHOD OPTION RECORDS
960
ACCESS TAG TO CONTROL MODIFICATION OF THIS RECORD
962
METHOD OPTION RECORD 1
924(o)(a)(1)
LENGTH OF THIS RECORD
964
LENGTH OF DATA AREA
966
METHOD ID (TYPE/OWNER/CLASS/INSTANCE)
968
CORRELATION TAG FOR CORRELATION WITH REQUIRED METHOD
970
ACCESS TAG TO CONTROL MODIFICATION OF THIS RECORD
972
METHOD SPECIFIC ATTRIBUTES
974
DATA AREA
976
CHECK VALUE
978
924(o)(a)(2)
METHOD OPTION RECORD 2
920(o)(b)
REQUIRED METHOD RECORD 2
CHECK VALUE
906a
RIGHTS RECORD 1
906b
RIGHTS RECORD 2
CHECK VALUE
980
PERC

FIG. 26B



PERC RIGHTS RECORD

FIG. 27
SHIPPING TABLE

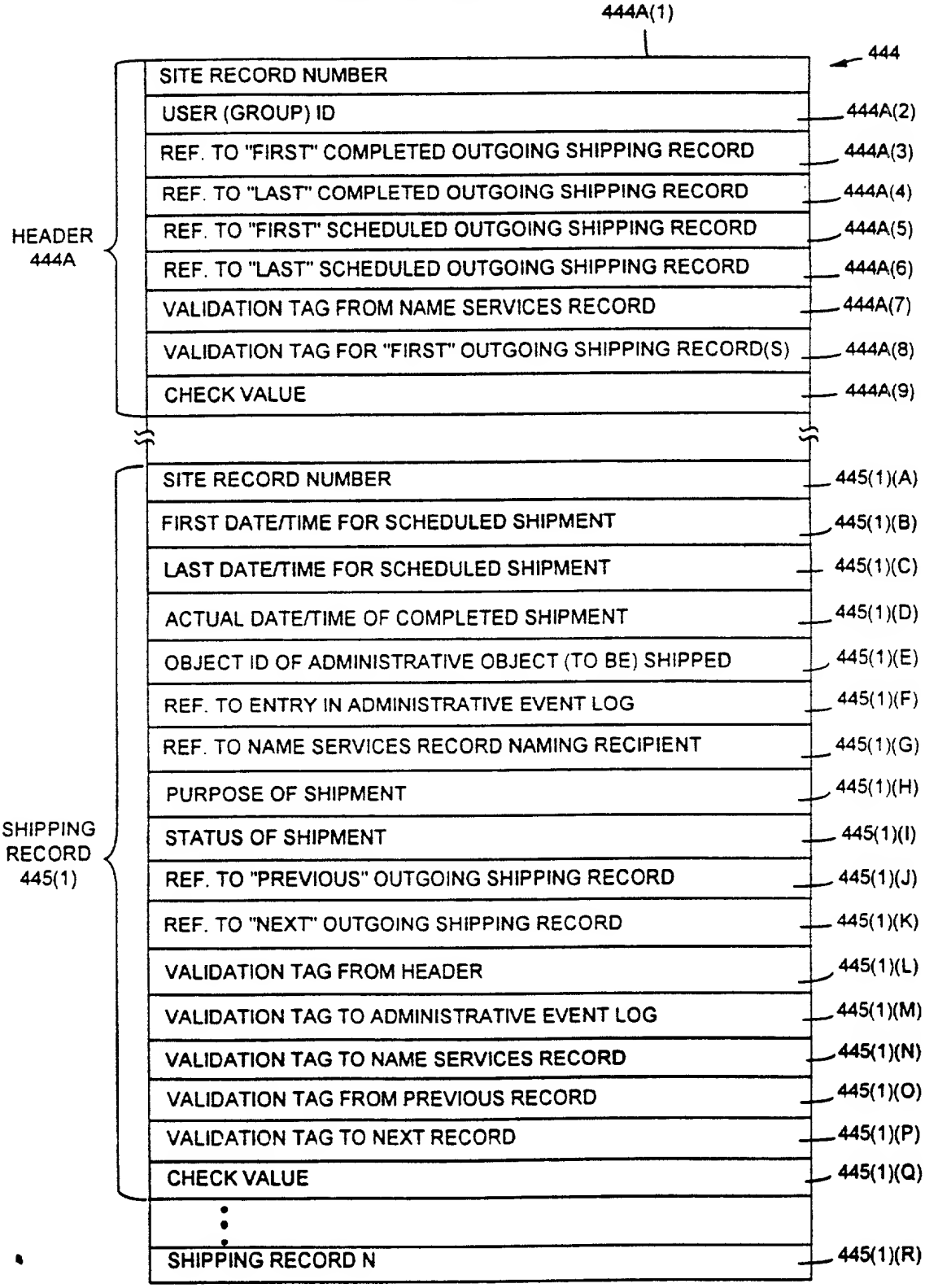


FIG. 28
RECEIVING TABLE

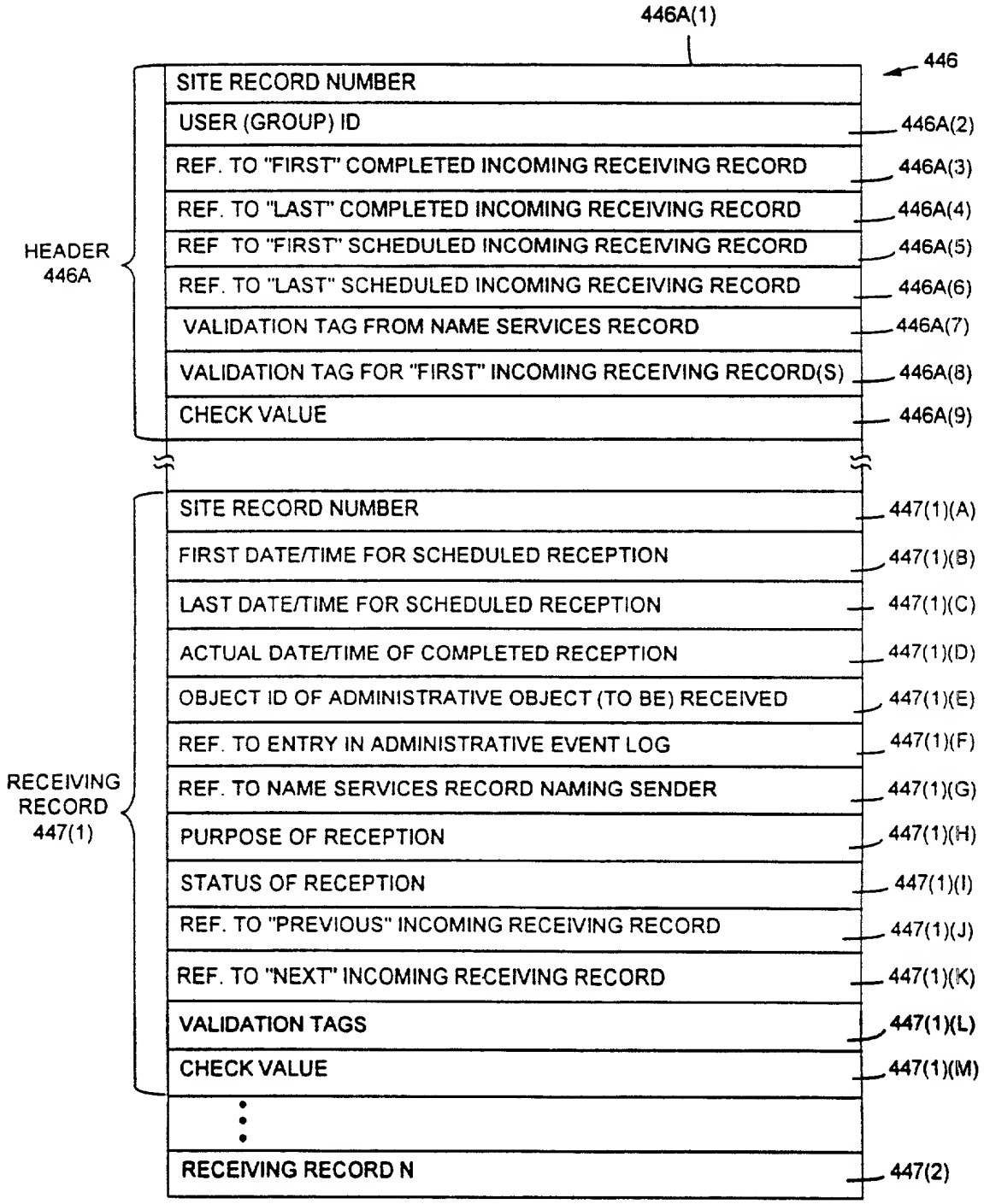


FIG. 29
ADMINISTRATIVE EVENT LOG

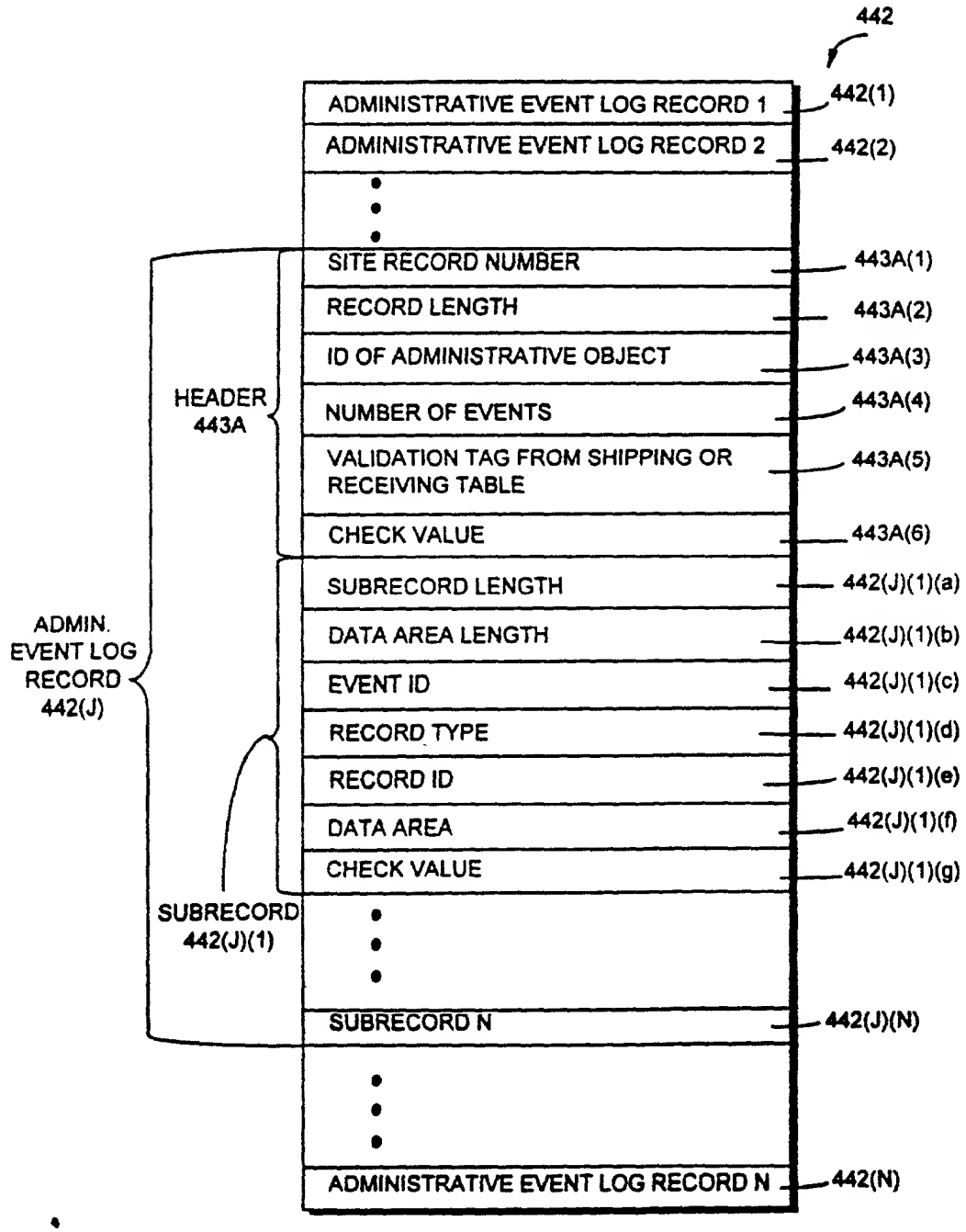


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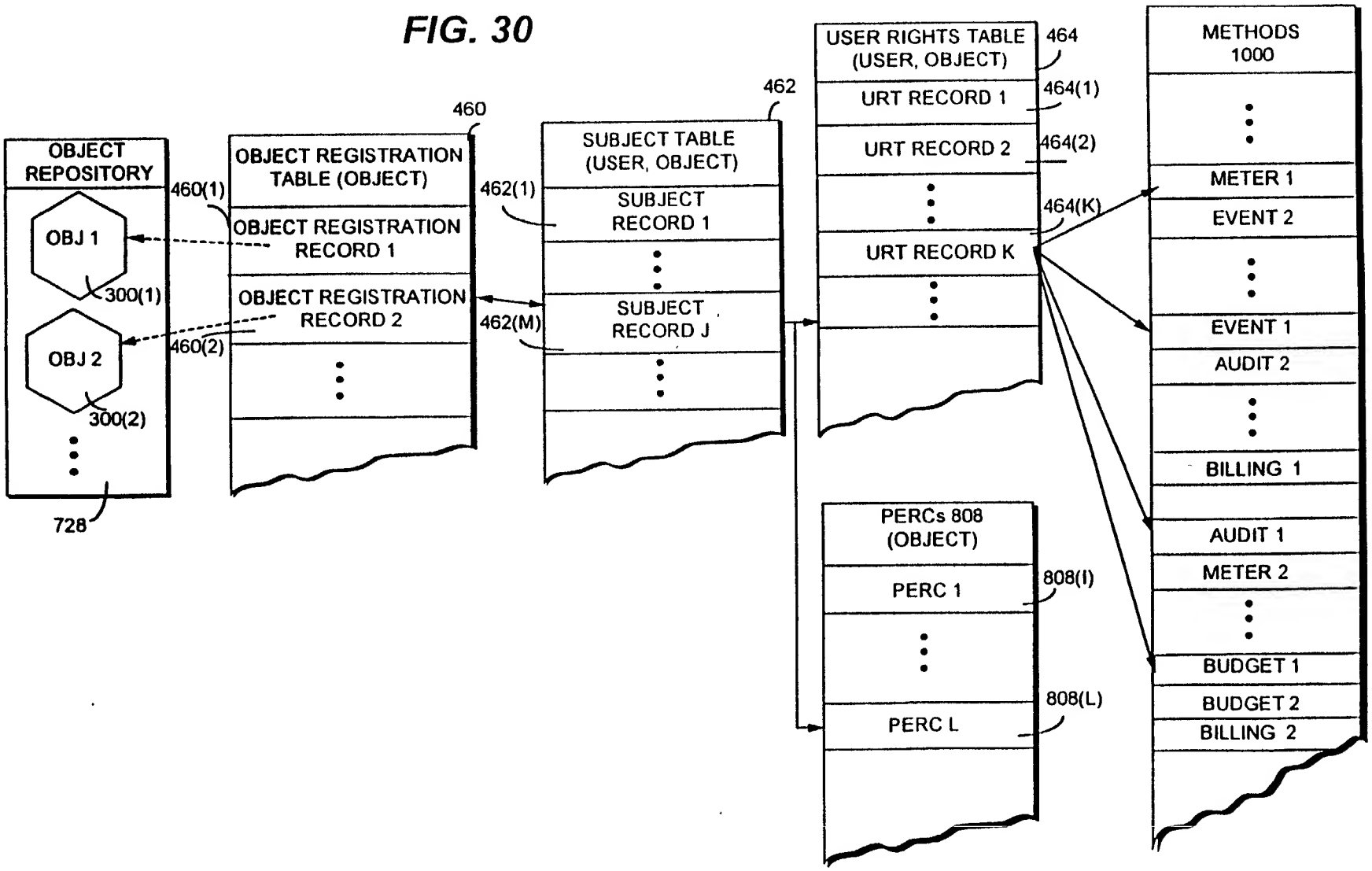
FIG. 30



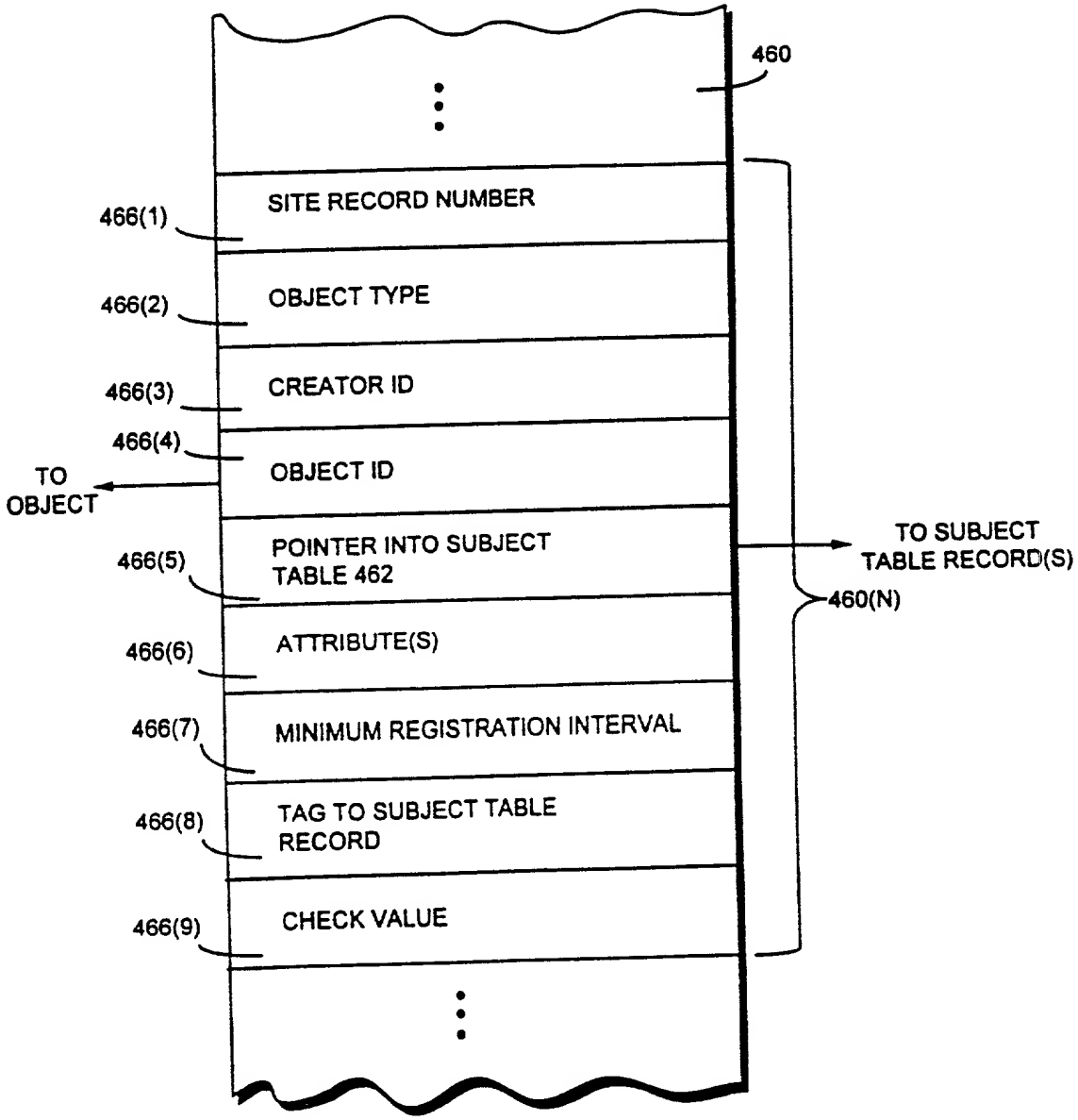


FIG. 31
OBJECT REGISTRATION TABLE

FIG. 32

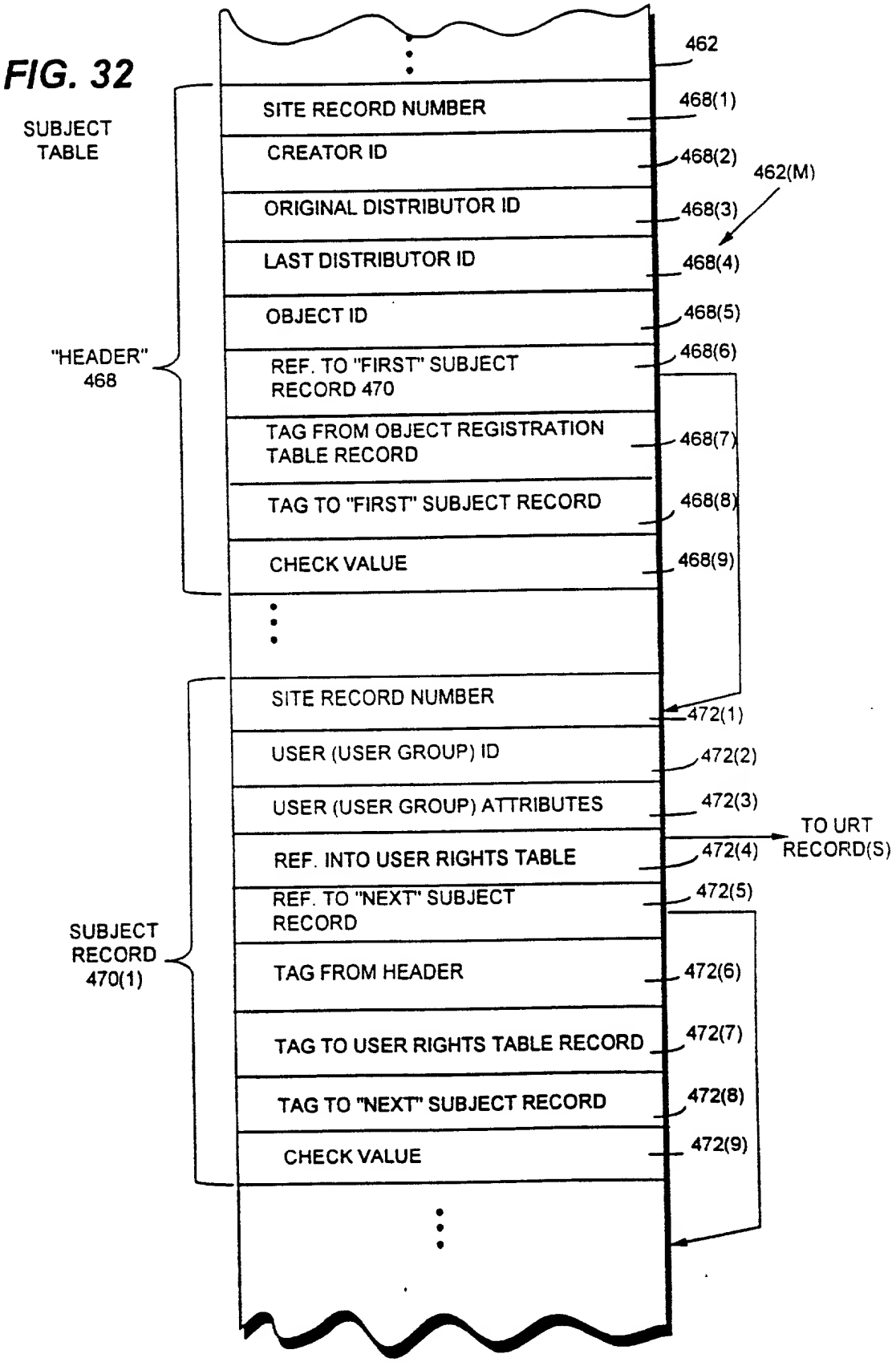

SUBJECT TABLE
462
SITE RECORD NUMBER
468(1)
CREATOR ID
468(2)
462(M)
ORIGINAL DISTRIBUTOR ID
468(3)
LAST DISTRIBUTOR ID
468(4)
OBJECT ID
468(5)
"HEADER" 468
REF. TO "FIRST" SUBJECT RECORD 470
468(6)
TAG FROM OBJECT REGISTRATION TABLE RECORD
468(7)
TAG TO "FIRST" SUBJECT RECORD
468(8)
CHECK VALUE
468(9)
SITE RECORD NUMBER
472(1)
USER (USER GROUP) ID
472(2)
USER (USER GROUP) ATTRIBUTES
472(3)
TO URT RECORD(S)
REF. INTO USER RIGHTS TABLE
472(4)
REF. TO "NEXT" SUBJECT RECORD
472(5)
SUBJECT RECORD 470(1)
TAG FROM HEADER
472(6)
TAG TO USER RIGHTS TABLE RECORD
472(7)
TAG TO "NEXT" SUBJECT RECORD
472(8)
CHECK VALUE
472(9)

FIG. 33 USER RIGHTS TABLE

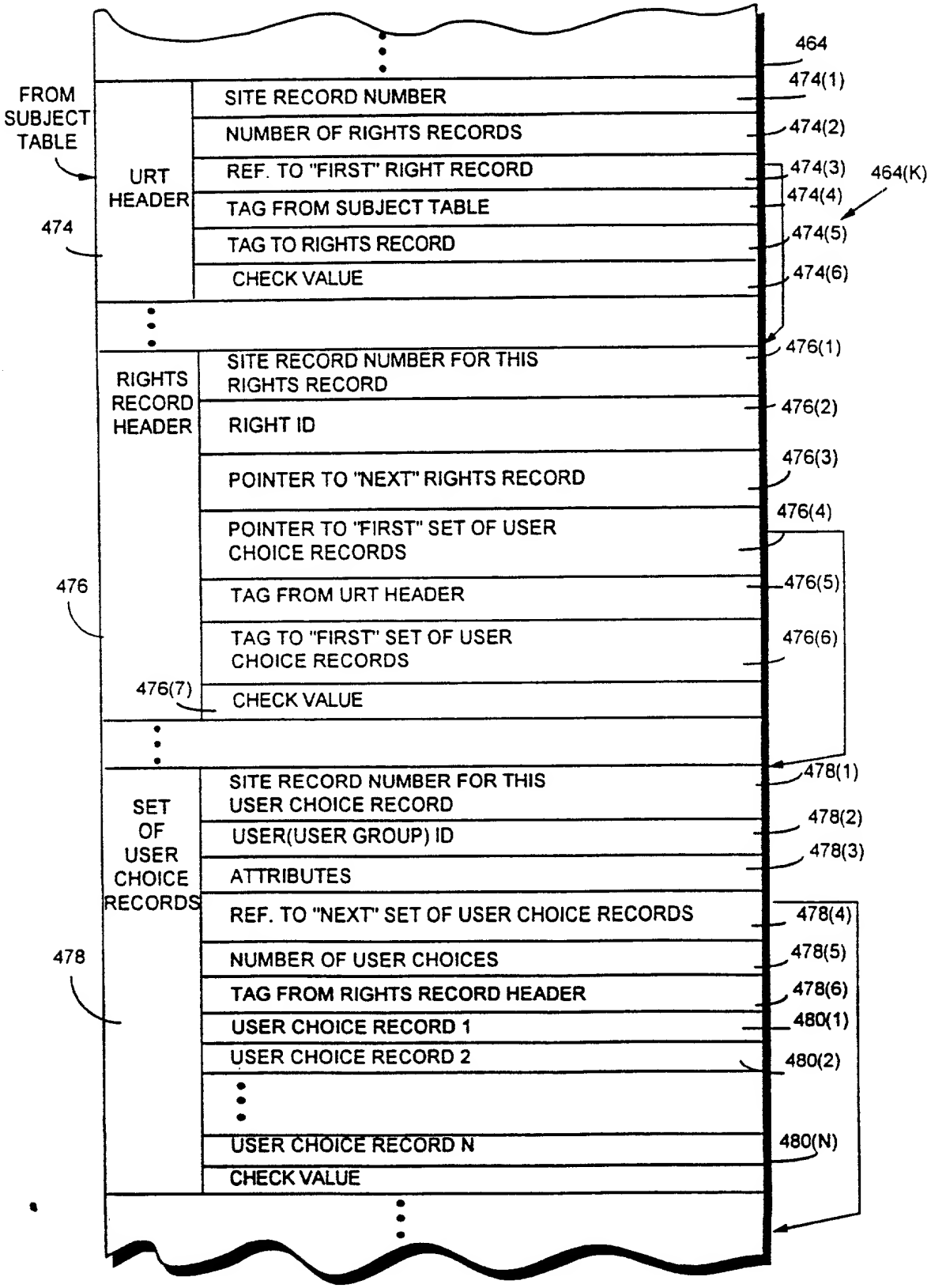


FIG. 34A

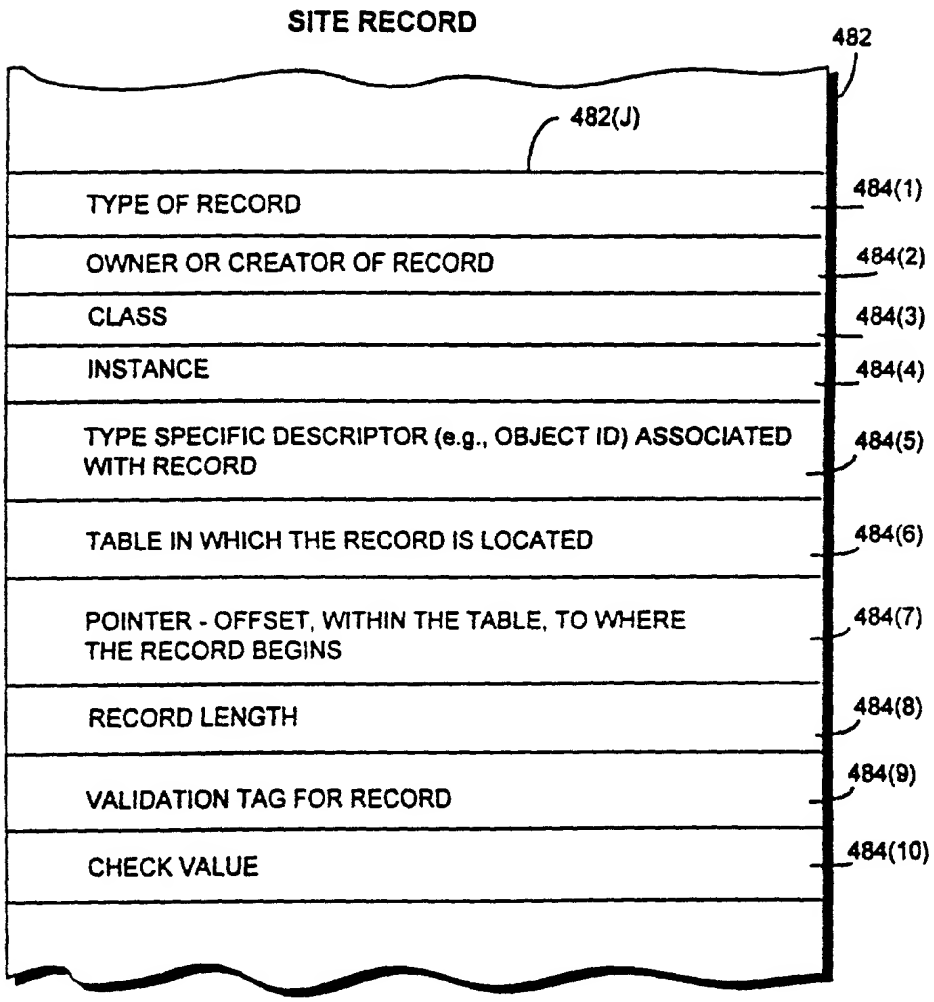

SITE RECORD
482
482(J)
TYPE OF RECORD
484(1)
OWNER OR CREATOR OF RECORD
484(2)
CLASS
484(3)
INSTANCE
484(4)
TYPE SPECIFIC DESCRIPTOR (e.g., OBJECT ID) ASSOCIATED WITH RECORD
484(5)
TABLE IN WHICH THE RECORD IS LOCATED
484(6)
POINTER - OFFSET, WITHIN THE TABLE, TO WHERE THE RECORD BEGINS
484(7)
RECORD LENGTH
484(8)
VALIDATION TAG FOR RECORD
484(9)
CHECK VALUE
484(10)

FIG. 34

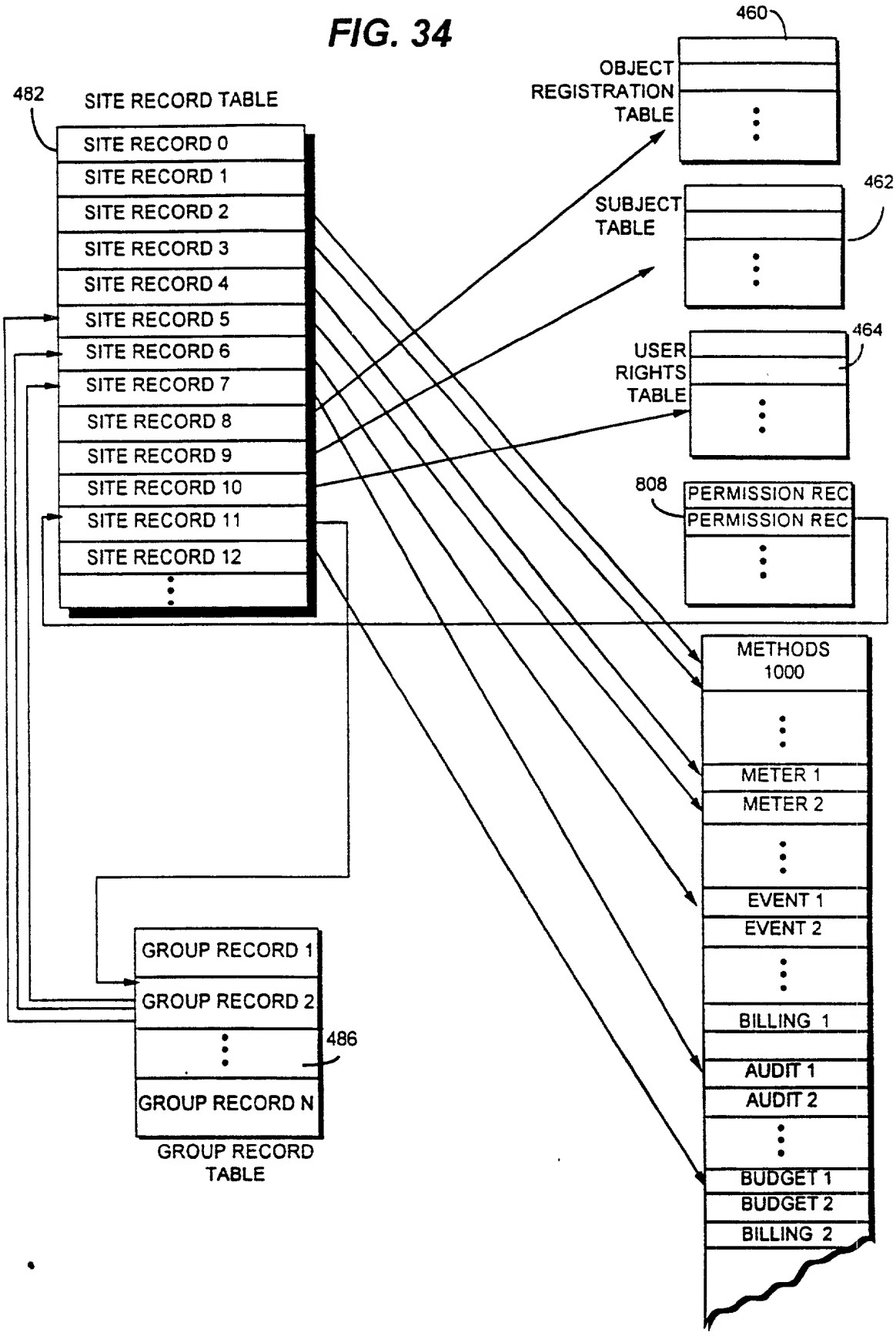
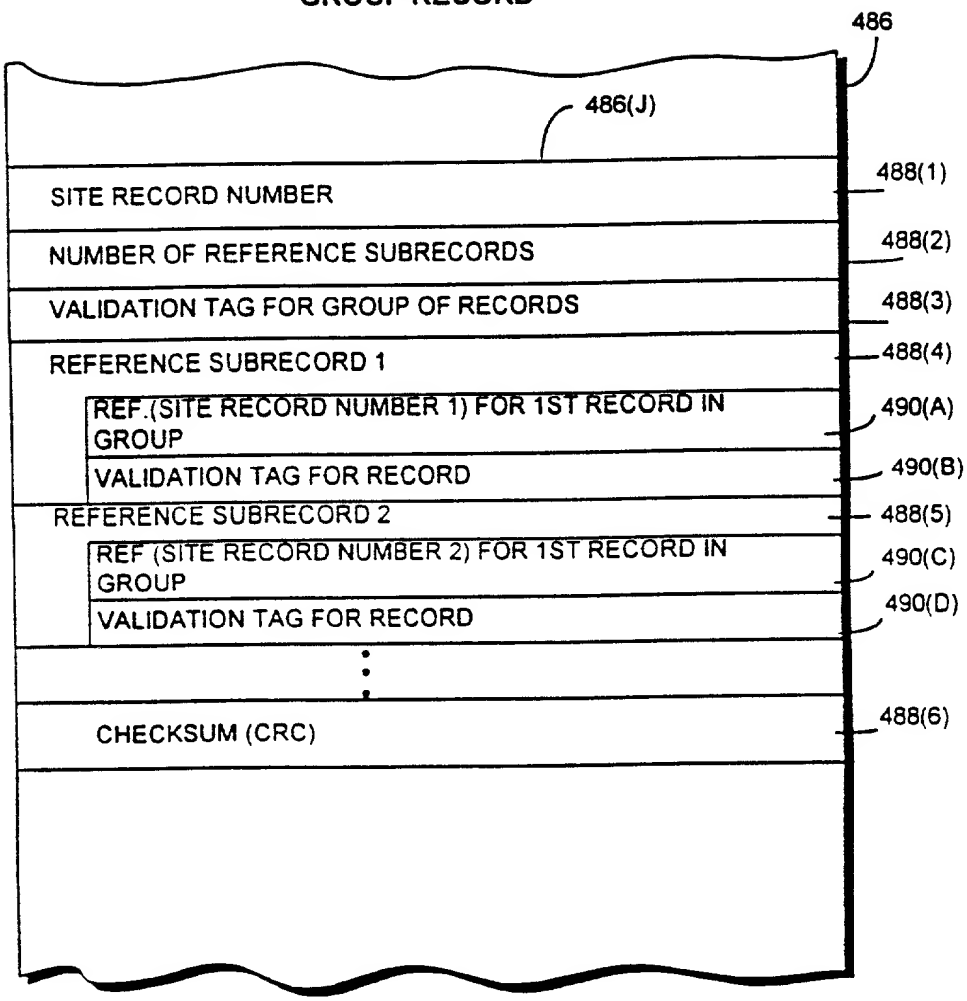

460
OBJECT REGISTRATION TABLE
482
SITE RECORD TABLE
SITE RECORD 0
SITE RECORD 1
SITE RECORD 2
SITE RECORD 3
SITE RECORD 4
SITE RECORD 5
SITE RECORD 6
SITE RECORD 7
SITE RECORD 8
SITE RECORD 9
SITE RECORD 10
SITE RECORD 11
SITE RECORD 12
462
SUBJECT TABLE
464
USER RIGHTS TABLE
808
PERMISSION REC
PERMISSION REC
METHODS 1000
METER 1
METER 2
EVENT 1
EVENT 2
BILLING 1
AUDIT 1
AUDIT 2
BUDGET 1
BUDGET 2
BILLING 2
GROUP RECORD 1
GROUP RECORD 2
486
GROUP RECORD N
GROUP RECORD TABLE

FIG. 34B


GROUP RECORD
486
486(J)
SITE RECORD NUMBER
488(1)
NUMBER OF REFERENCE SUBRECORDS
488(2)
VALIDATION TAG FOR GROUP OF RECORDS
488(3)
REFERENCE SUBRECORD 1
488(4)
REF.(SITE RECORD NUMBER 1) FOR 1ST RECORD IN GROUP
490(A)
VALIDATION TAG FOR RECORD
490(B)
REFERENCE SUBRECORD 2
488(5)
REF (SITE RECORD NUMBER 2) FOR 1ST RECORD IN GROUP
490(C)
VALIDATION TAG FOR RECORD
490(D)
CHECKSUM (CRC)
488(6)

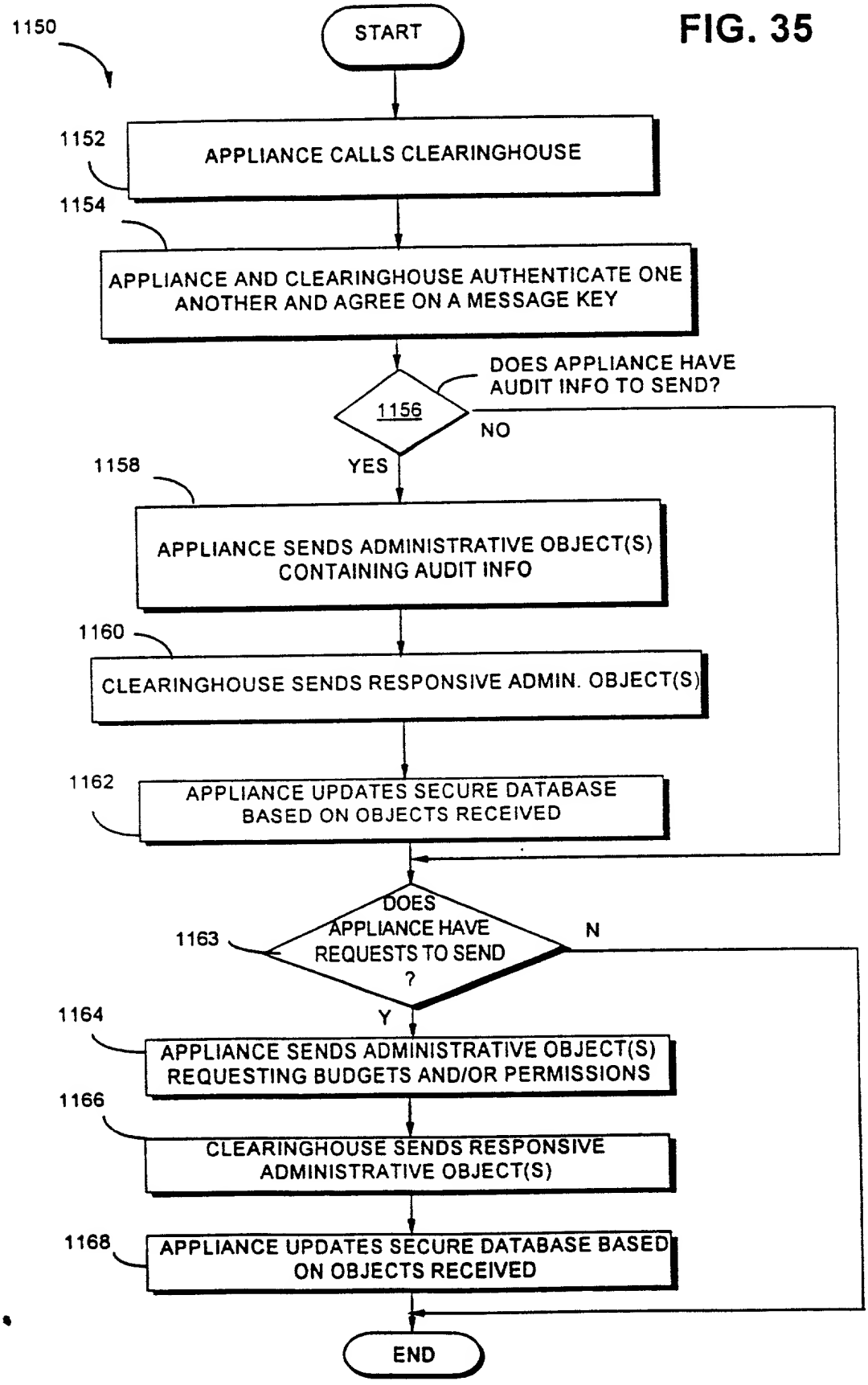

1150
START
1152
APPLIANCE CALLS CLEARINGHOUSE
1154
APPLIANCE AND CLEARINGHOUSE AUTHENTICATE ONE ANOTHER AND AGREE ON A MESSAGE KEY
DOES APPLIANCE HAVE AUDIT INFO TO SEND?
1156
NO
YES
1158
APPLIANCE SENDS ADMINISTRATIVE OBJECT(S) CONTAINING AUDIT INFO
1160
CLEARINGHOUSE SENDS RESPONSIVE ADMIN. OBJECT(S)
1162
APPLIANCE UPDATES SECURE DATABASE BASED ON OBJECTS RECEIVED
1163
DOES APPLIANCE HAVE REQUESTS TO SEND ?
N
Y
1164
APPLIANCE SENDS ADMINISTRATIVE OBJECT(S) REQUESTING BUDGETS AND/OR PERMISSIONS
1166
CLEARINGHOUSE SENDS RESPONSIVE ADMINISTRATIVE OBJECT(S)
1168
APPLIANCE UPDATES SECURE DATABASE BASED ON OBJECTS RECEIVED
END

FIG. 35

TOCTOU Detected

FIG. 36

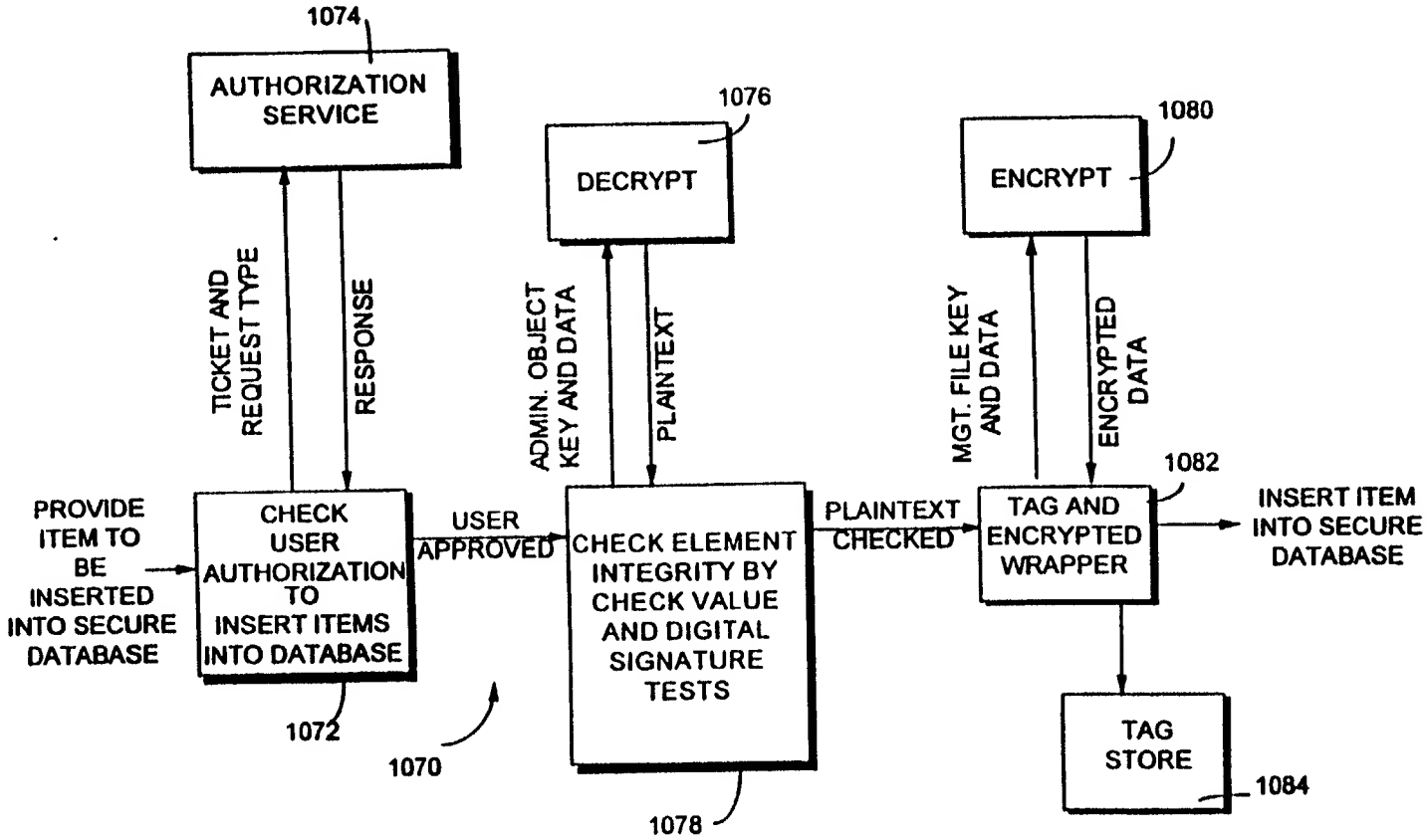


FIG. 37

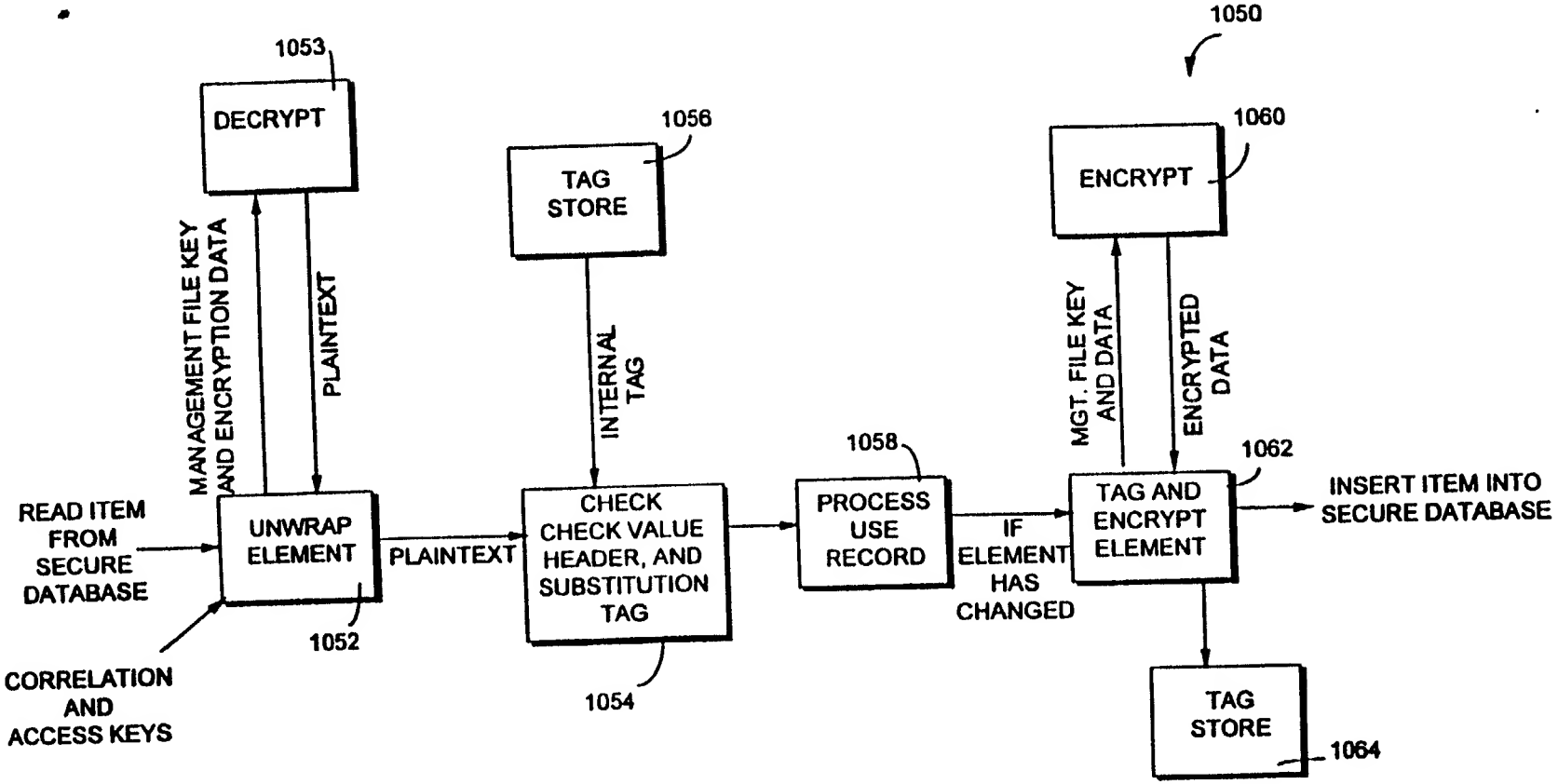

1050
1053
DECRYPT
1056
TAG STORE
1060
ENCRYPT
MANAGEMENT FILE KEY AND ENCRYPTION DATA
PLAINTEXT
INTERNAL TAG
MGT. FILE KEY AND DATA
ENCRYPTED DATA
1058
1062
READ ITEM FROM SECURE DATABASE
UNWRAP ELEMENT
PLAINTEXT
CHECK CHECK VALUE HEADER, AND SUBSTITUTION TAG
PROCESS USE RECORD
IF ELEMENT HAS CHANGED
TAG AND ENCRYPT ELEMENT
INSERT ITEM INTO SECURE DATABASE
1052
1054
CORRELATION AND ACCESS KEYS
TAG STORE
1064

FIG. 38

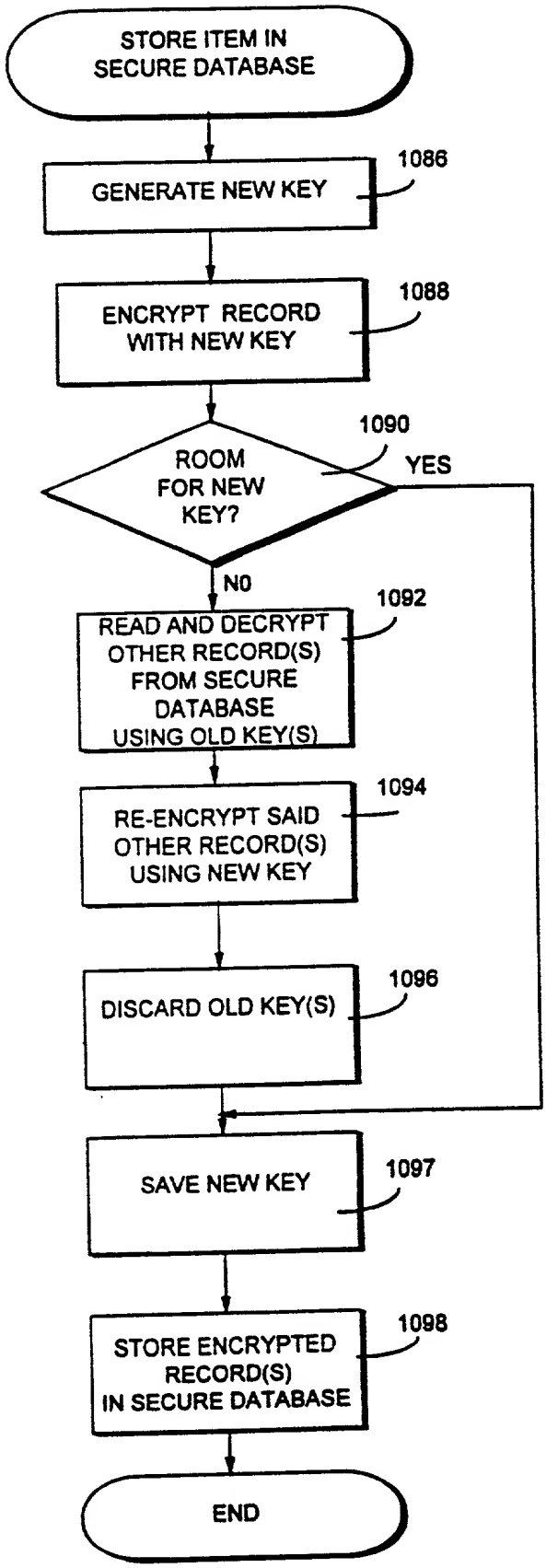

STORE ITEM IN SECURE DATABASE
GENERATE NEW KEY
1086
ENCRYPT RECORD WITH NEW KEY
1088
ROOM FOR NEW KEY?
1090
YES
NO
READ AND DECRYPT OTHER RECORD(S) FROM SECURE DATABASE USING OLD KEY(S)
1092
RE-ENCRYPT SAID OTHER RECORD(S) USING NEW KEY
1094
DISCARD OLD KEY(S)
1096
SAVE NEW KEY
1097
STORE ENCRYPTED RECORD(S) IN SECURE DATABASE
1098
END

FIG. 39
BACKUP

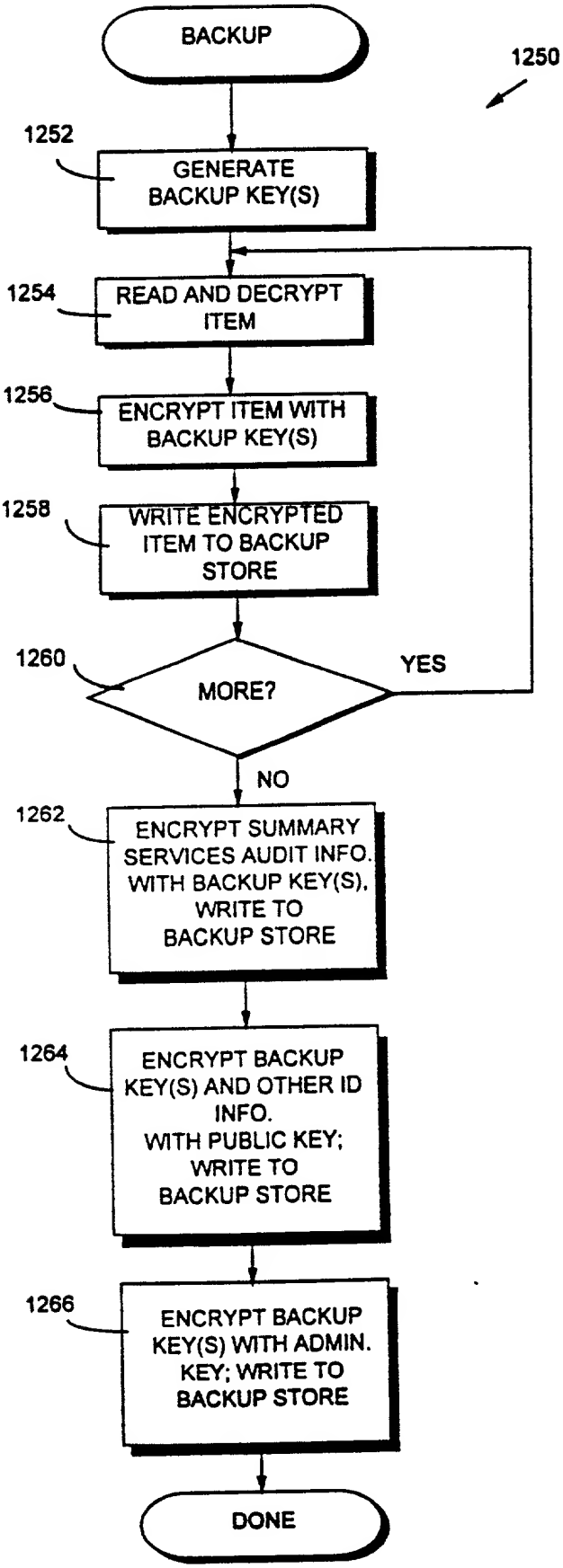
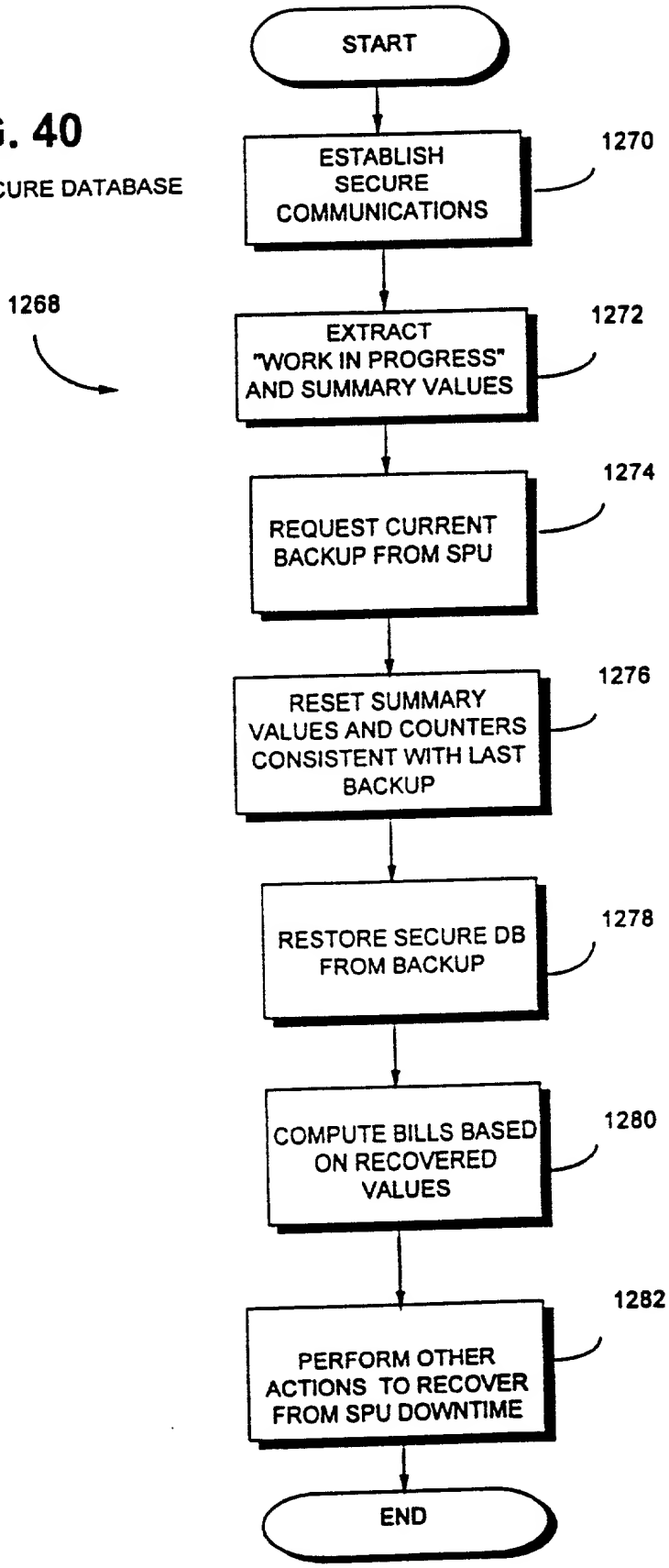


FIG. 40

RECOVER SECURE DATABASE



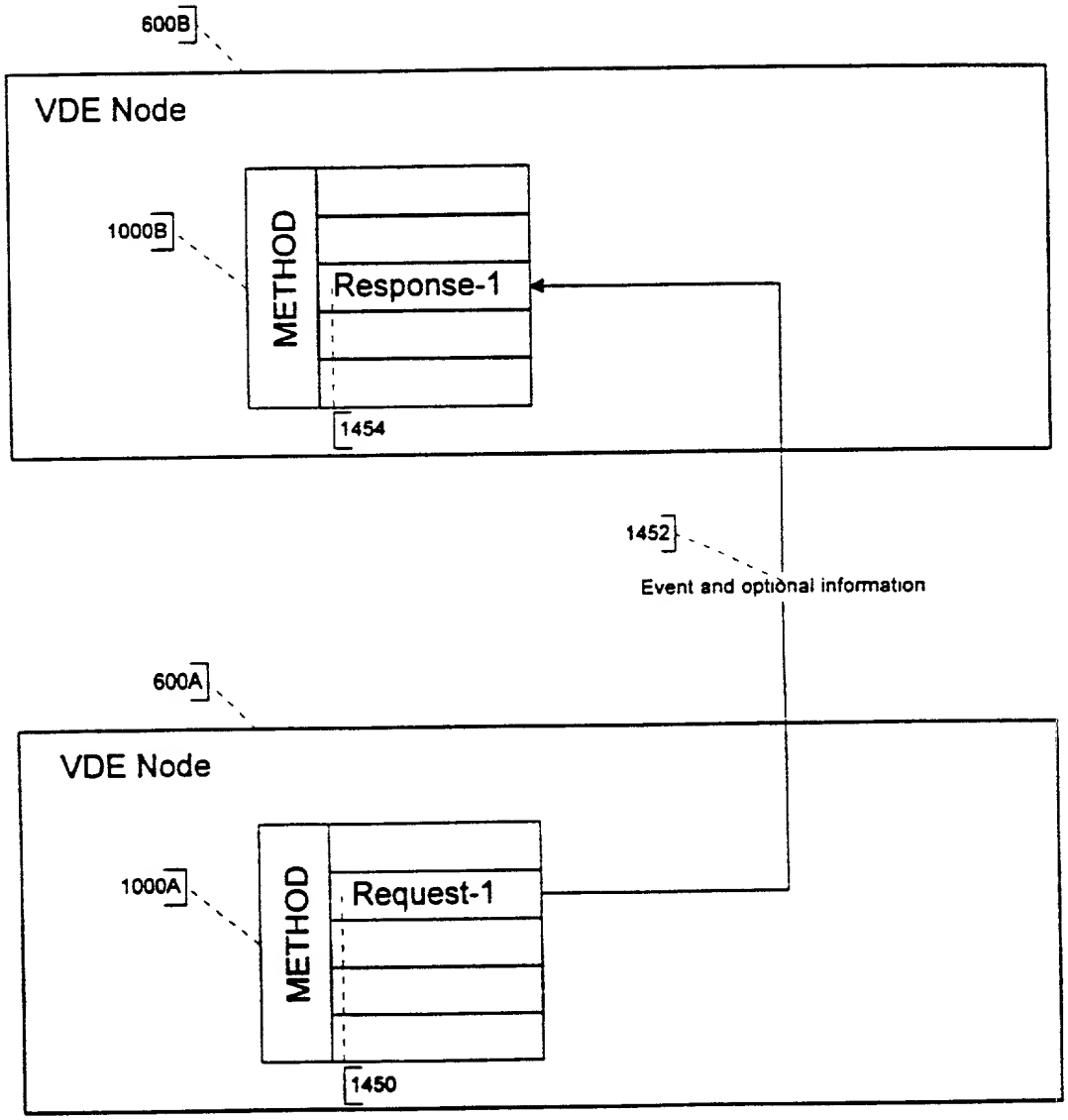

600B
VDE Node
1000B
METHOD
Response-1
1454
1452
Event and optional information
600A
VDE Node
1000A
METHOD
Request-1
1450

Figure 41a

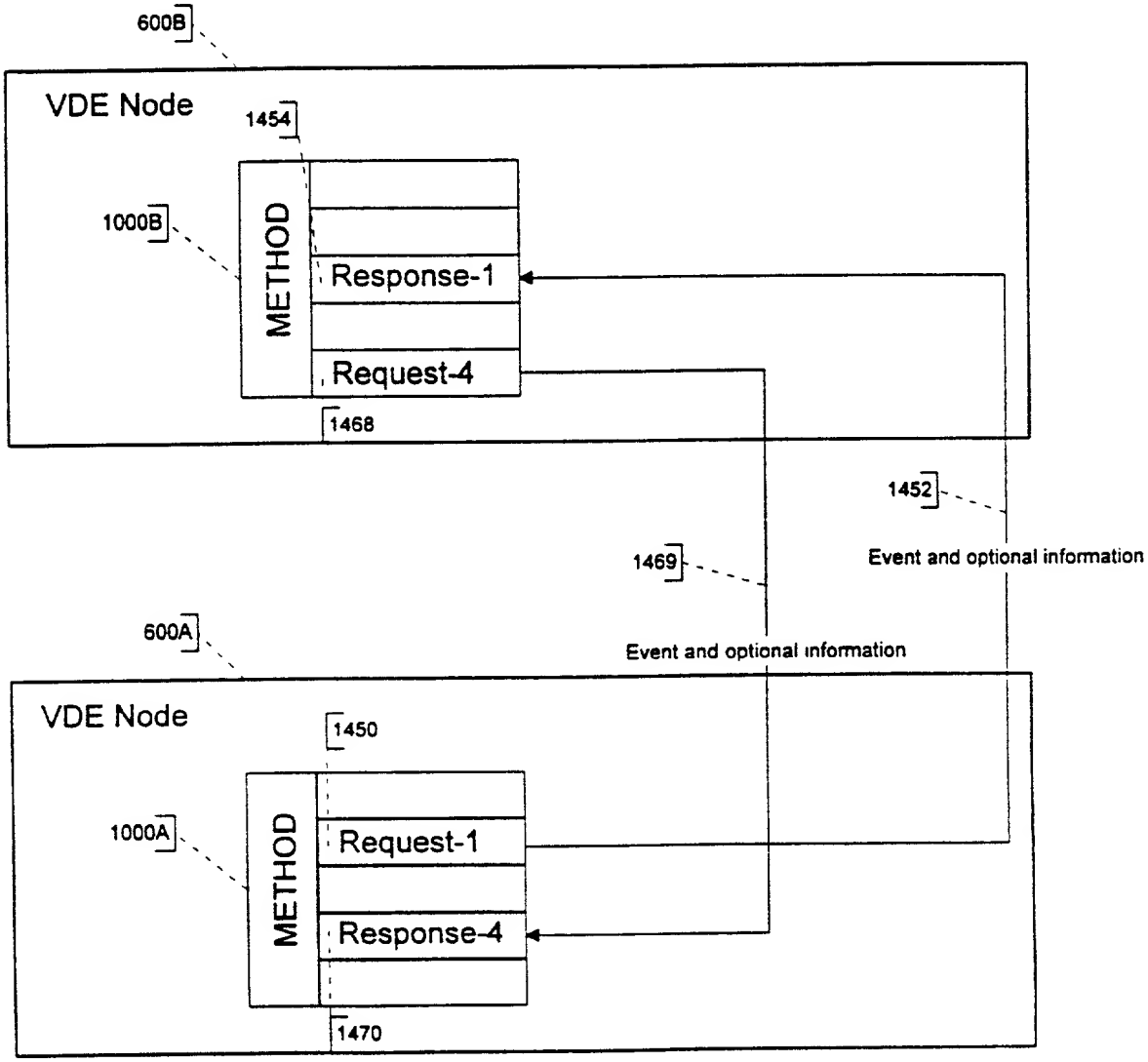

600B
VDE Node
1454
1000B
METHOD
Response-1
Request-4
1468
1452
Event and optional information
1469
Event and optional information
600A
VDE Node
1450
1000A
METHOD
Request-1
Response-4
1470

Figure 41b

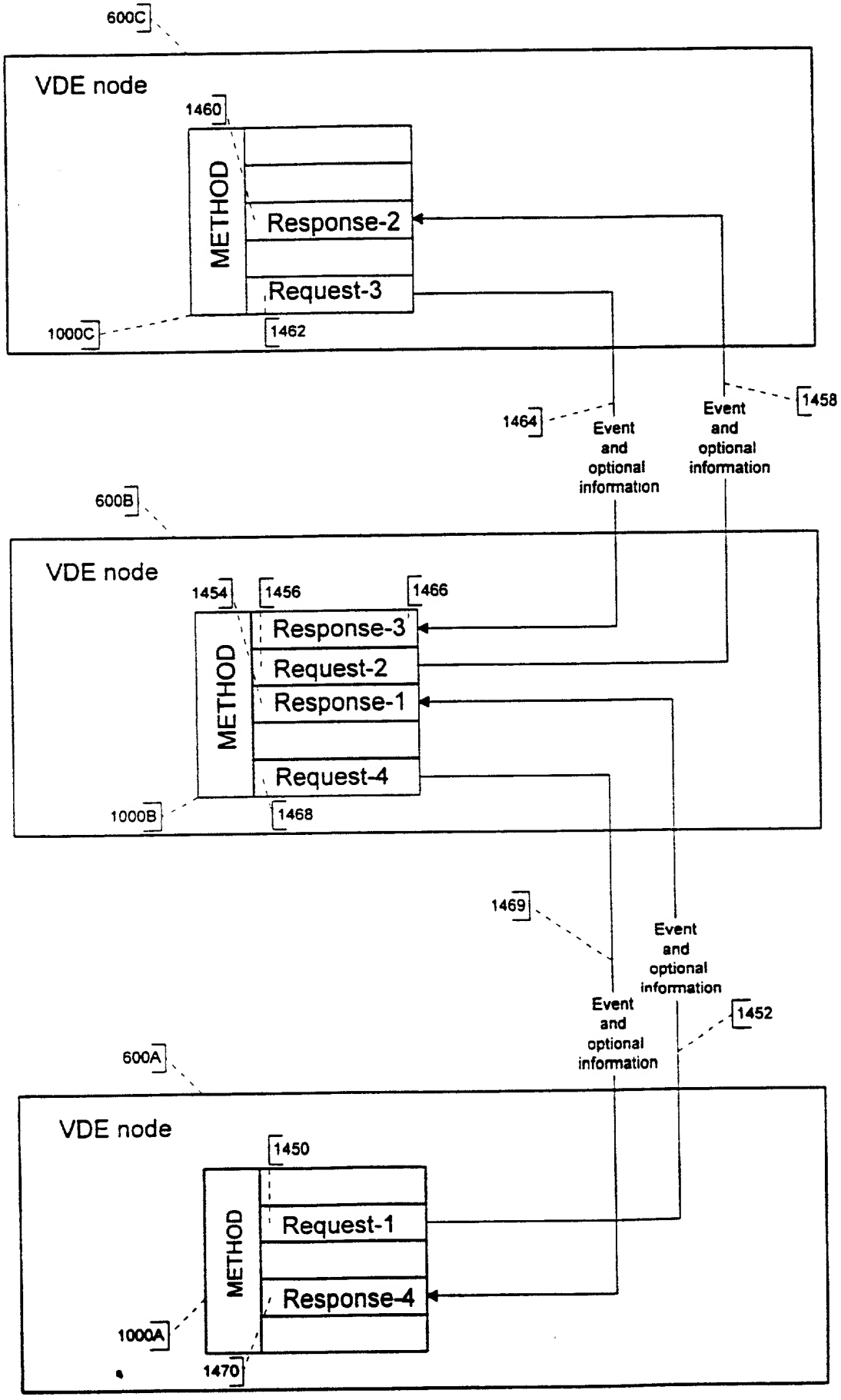

600C
VDE node
1460
METHOD
Response-2
Request-3
1000C
1462
1464
Event and optional information
1458
Event and optional information
600B
VDE node
1454
1456
1466
METHOD
Response-3
Request-2
Response-1
Request-4
1000B
1468
1469
Event and optional information
Event and optional information
1452
600A
VDE node
1450
METHOD
Request-1
Response-4
1000A
1470

Figure 41c

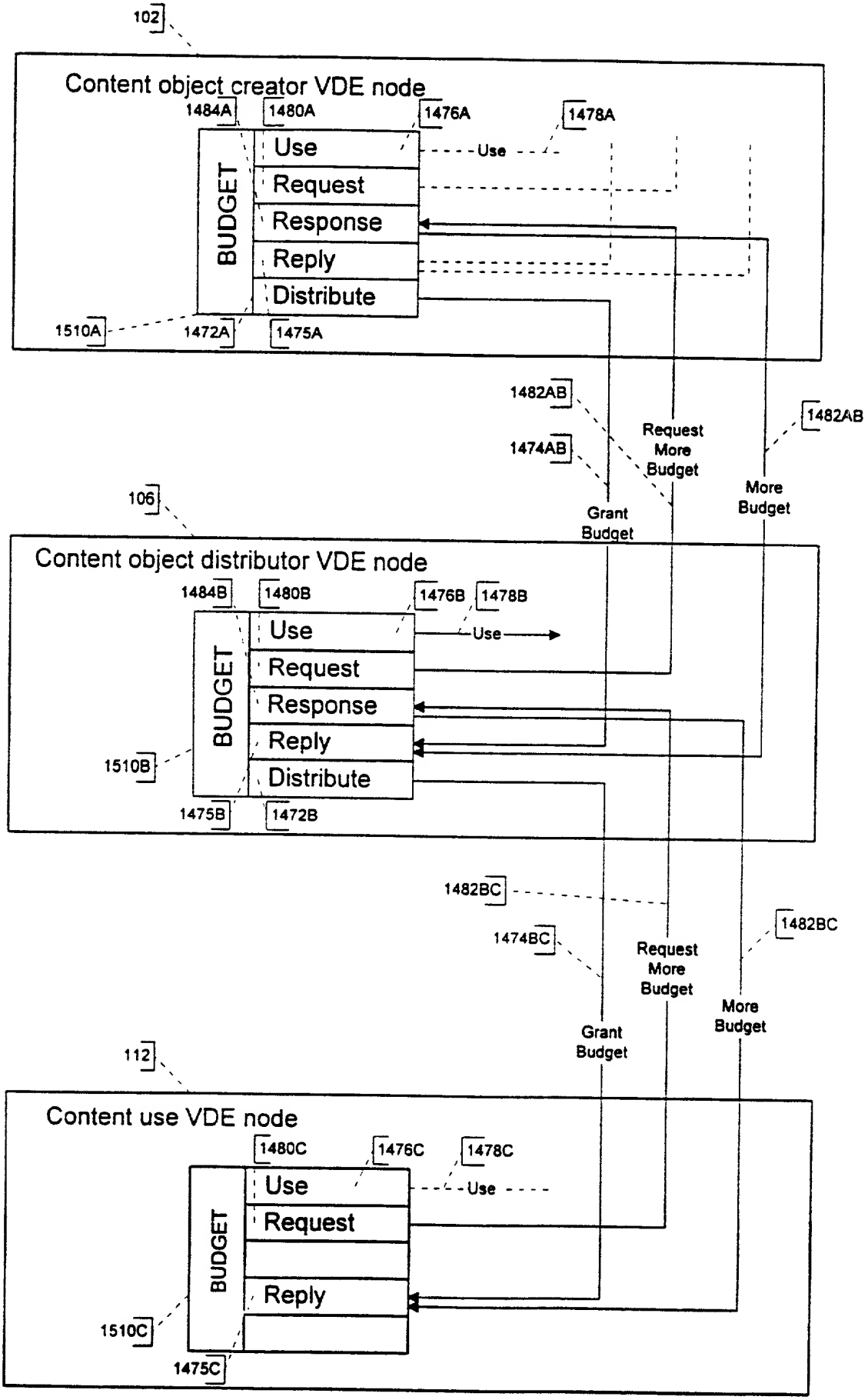
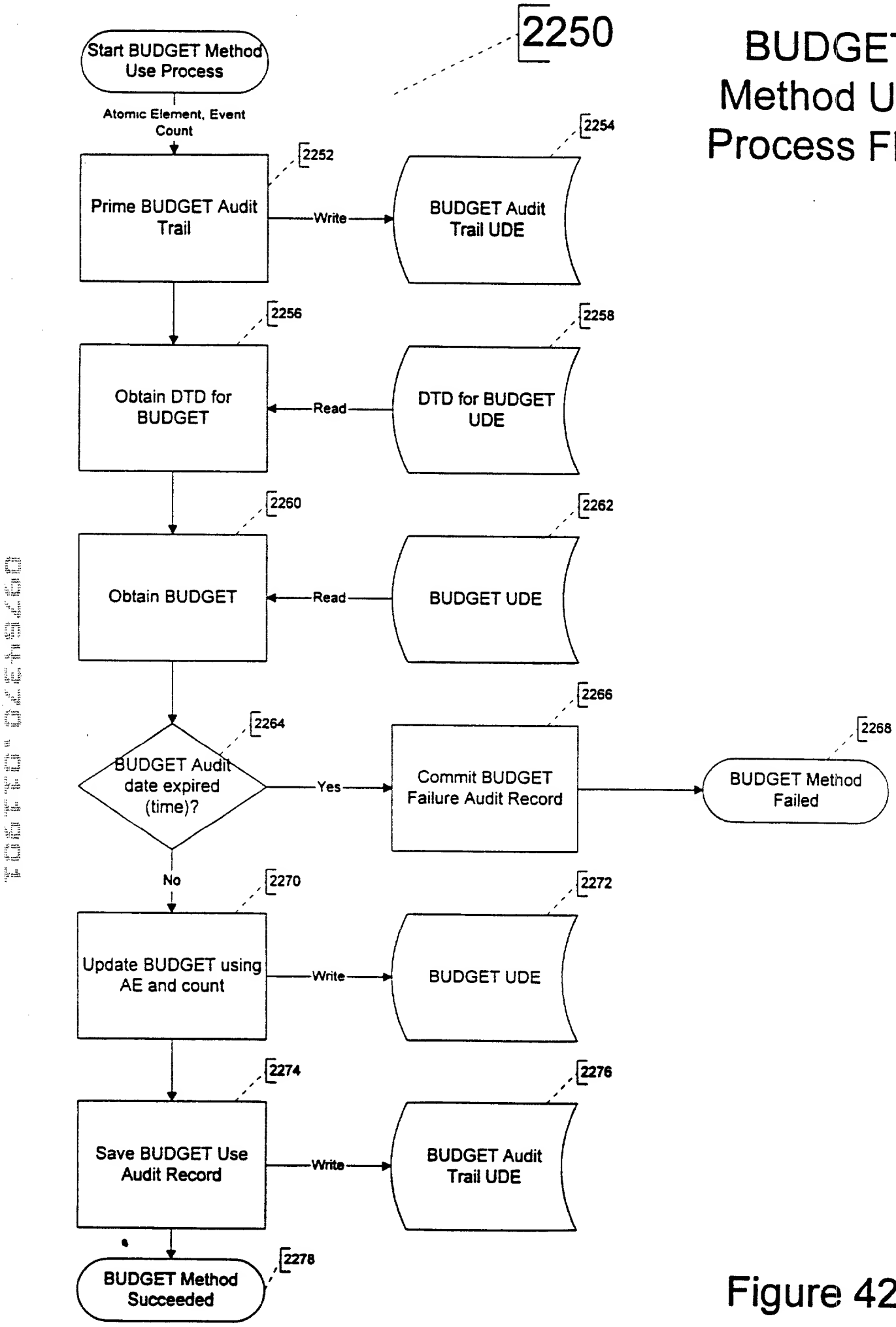

102
Content object creator VDE node
1484A
1480A
1476A
1478A
BUDGET
Use
Request
Response
Reply
Distribute
Use
1510A
1472A
1475A
1482AB
1474AB
Request More Budget
1482AB
More Budget
Grant Budget
106
Content object distributor VDE node
1484B
1480B
1476B
1478B
BUDGET
Use
Request
Response
Reply
Distribute
Use
1510B
1475B
1472B
1482BC
1474BC
Request More Budget
1482BC
More Budget
Grant Budget
112
Content use VDE node
1480C
1476C
1478C
BUDGET
Use
Request
Reply
Use
1510C
1475C

Figure 41d



BUDGET Method Use Process Flo\

Figure 42a

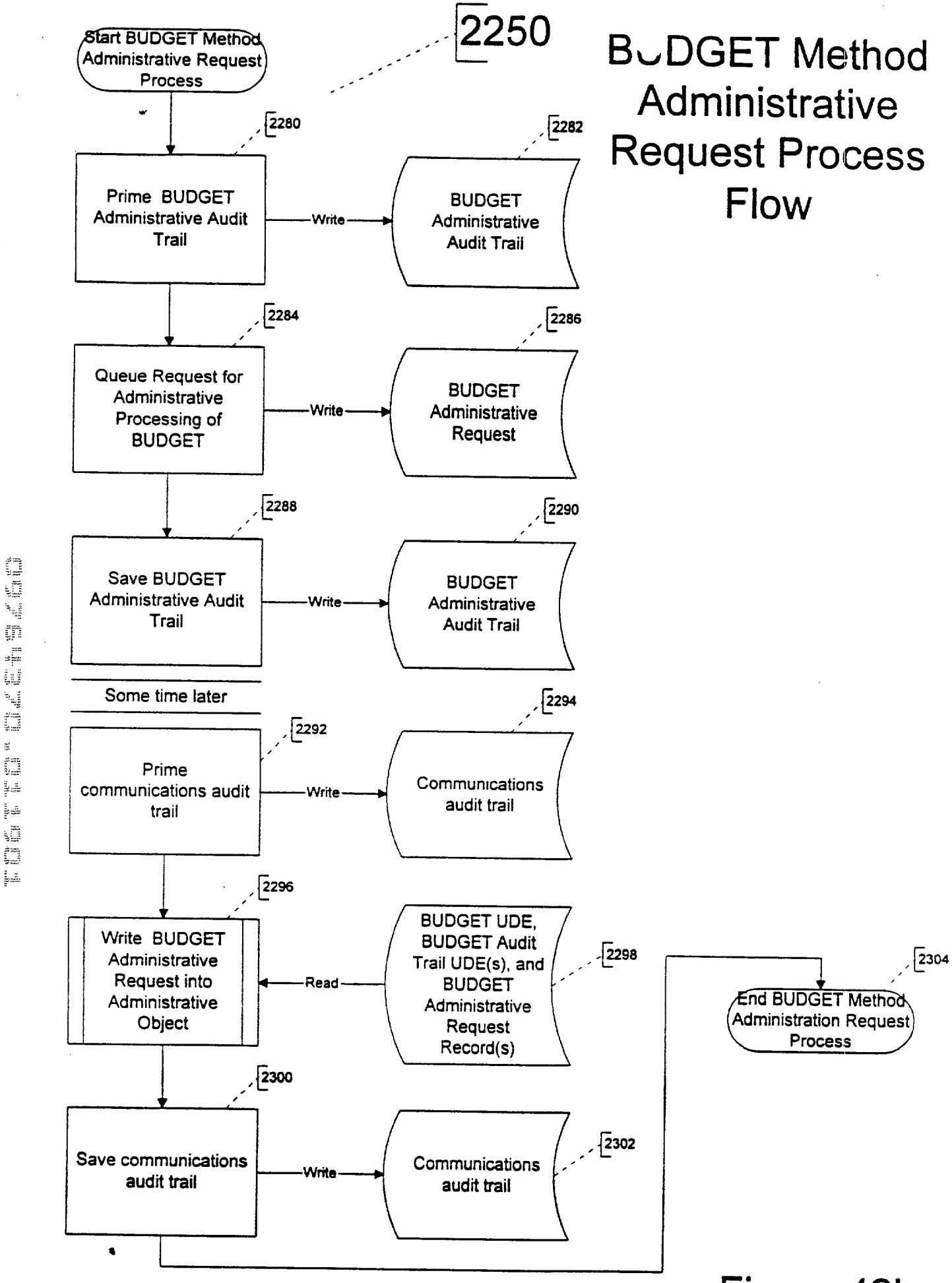
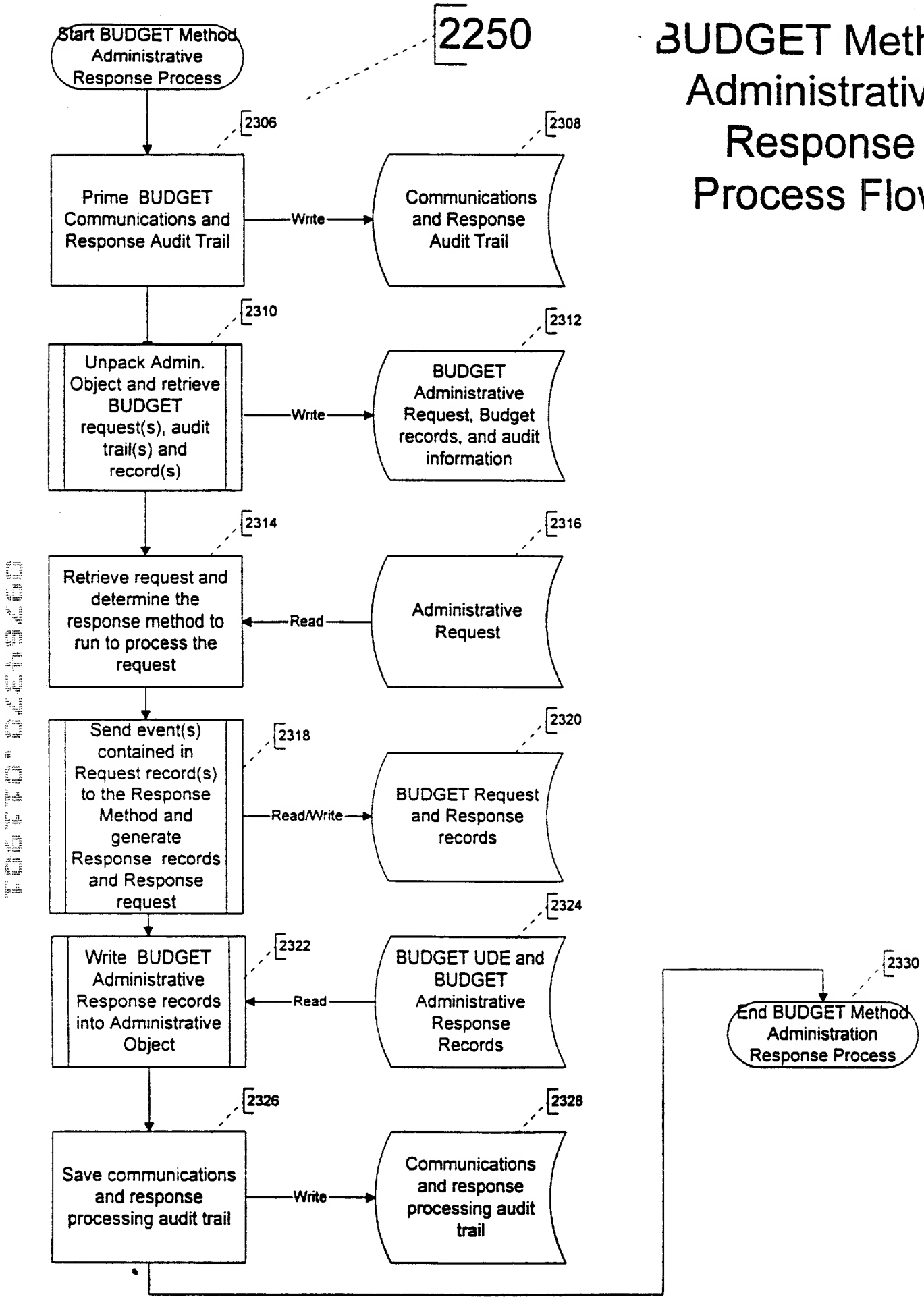

2250
BUDGET Method Administrative Request Process Flow
Start BUDGET Method Administrative Request Process
2280
Prime BUDGET Administrative Audit Trail
Write
2282
BUDGET Administrative Audit Trail
2284
Queue Request for Administrative Processing of BUDGET
Write
2286
BUDGET Administrative Request
2288
Save BUDGET Administrative Audit Trail
Write
2290
BUDGET Administrative Audit Trail
Some time later
2292
Prime communications audit trail
Write
2294
Communications audit trail
2296
Write BUDGET Administrative Request into Administrative Object
Read
BUDGET UDE, BUDGET Audit Trail UDE(s), and BUDGET Administrative Request Record(s)
2298
2300
Save communications audit trail
Write
Communications audit trail
2302
2304
End BUDGET Method Administration Request Process

Figure 42b



BUDGET Method Administrative Response Process Flow

Figure 42c

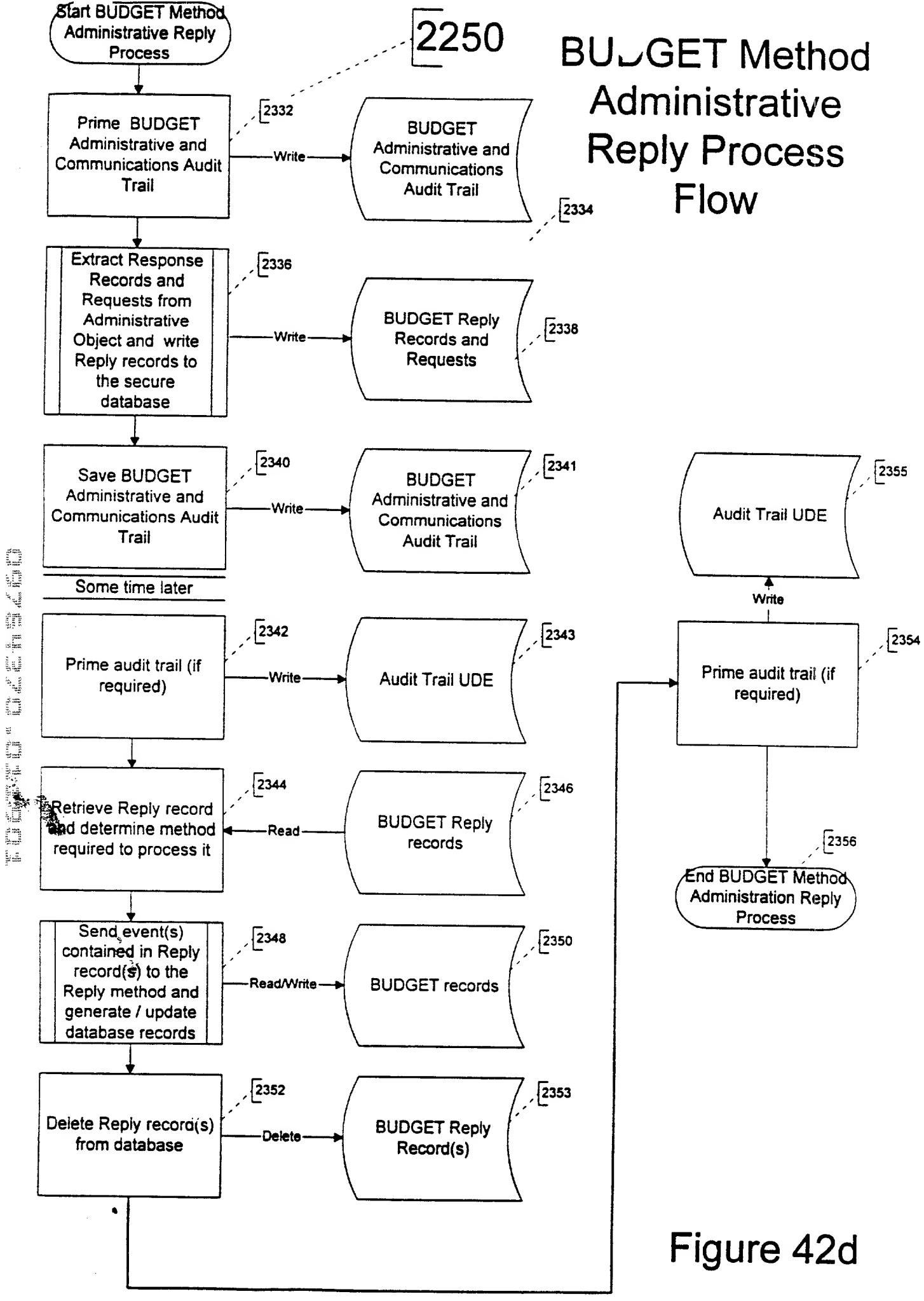
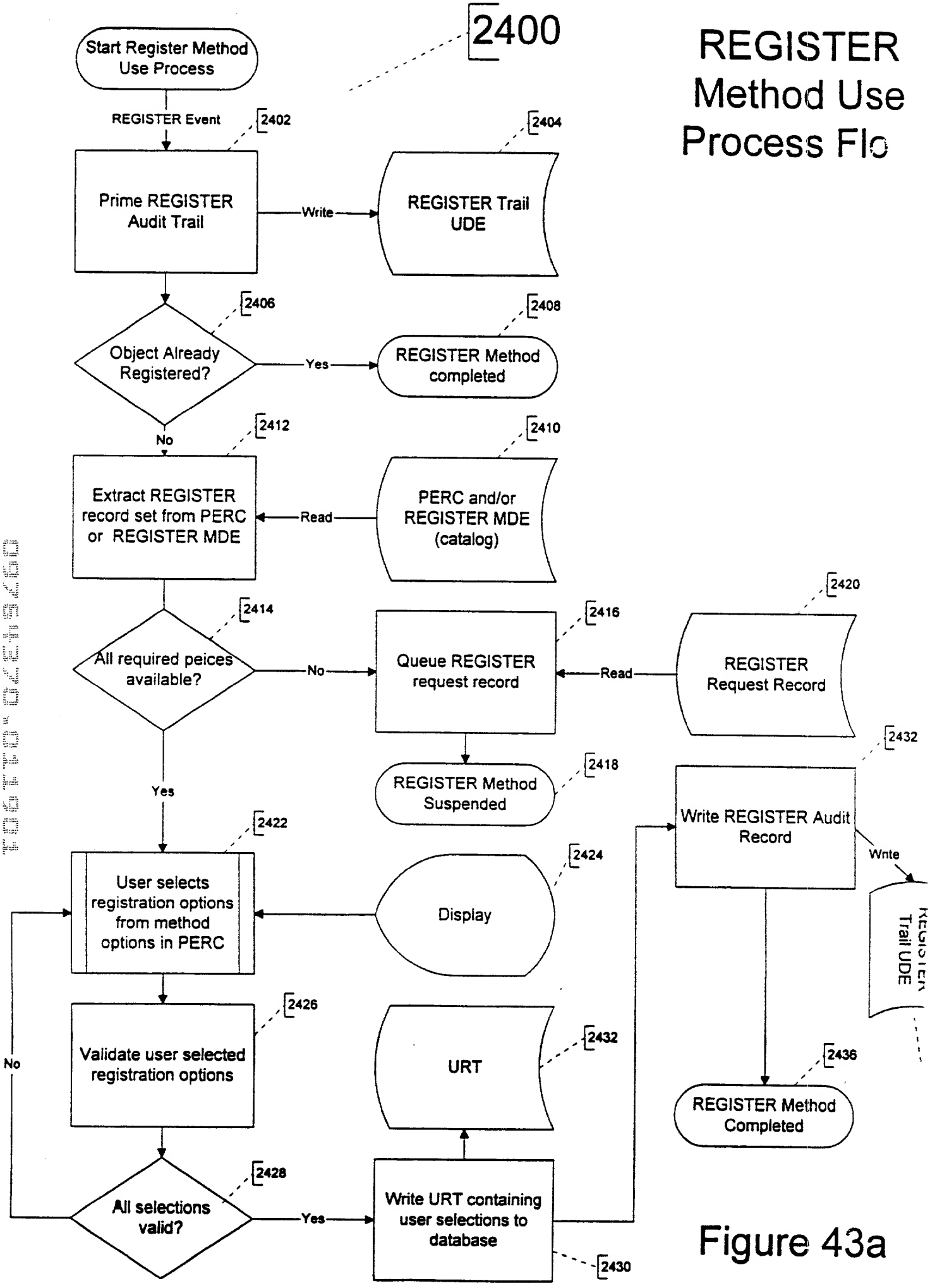

Start BUDGET Method Administrative Reply Process
2250
BUDGET Method Administrative Reply Process Flow
Prime BUDGET Administrative and Communications Audit Trail
2332
Write
BUDGET Administrative and Communications Audit Trail
2334
Extract Response Records and Requests from Administrative Object and write Reply records to the secure database
2336
Write
BUDGET Reply Records and Requests
2338
Save BUDGET Administrative and Communications Audit Trail
2340
Write
BUDGET Administrative and Communications Audit Trail
2341
Some time later
Prime audit trail (if required)
2342
Write
Audit Trail UDE
2343
Retrieve Reply record and determine method required to process it
2344
Read
BUDGET Reply records
2346
Send event(s) contained in Reply record(s) to the Reply method and generate / update database records
2348
Read/Write
BUDGET records
2350
Delete Reply record(s) from database
2352
Delete
BUDGET Reply Record(s)
2353
Audit Trail UDE
2355
Write
Prime audit trail (if required)
2354
End BUDGET Method Administration Reply Process
2356

Figure 42d



REGISTER Method Use Process Flo

Figure 43a

REGISTER Method Administrative Request Process Flow

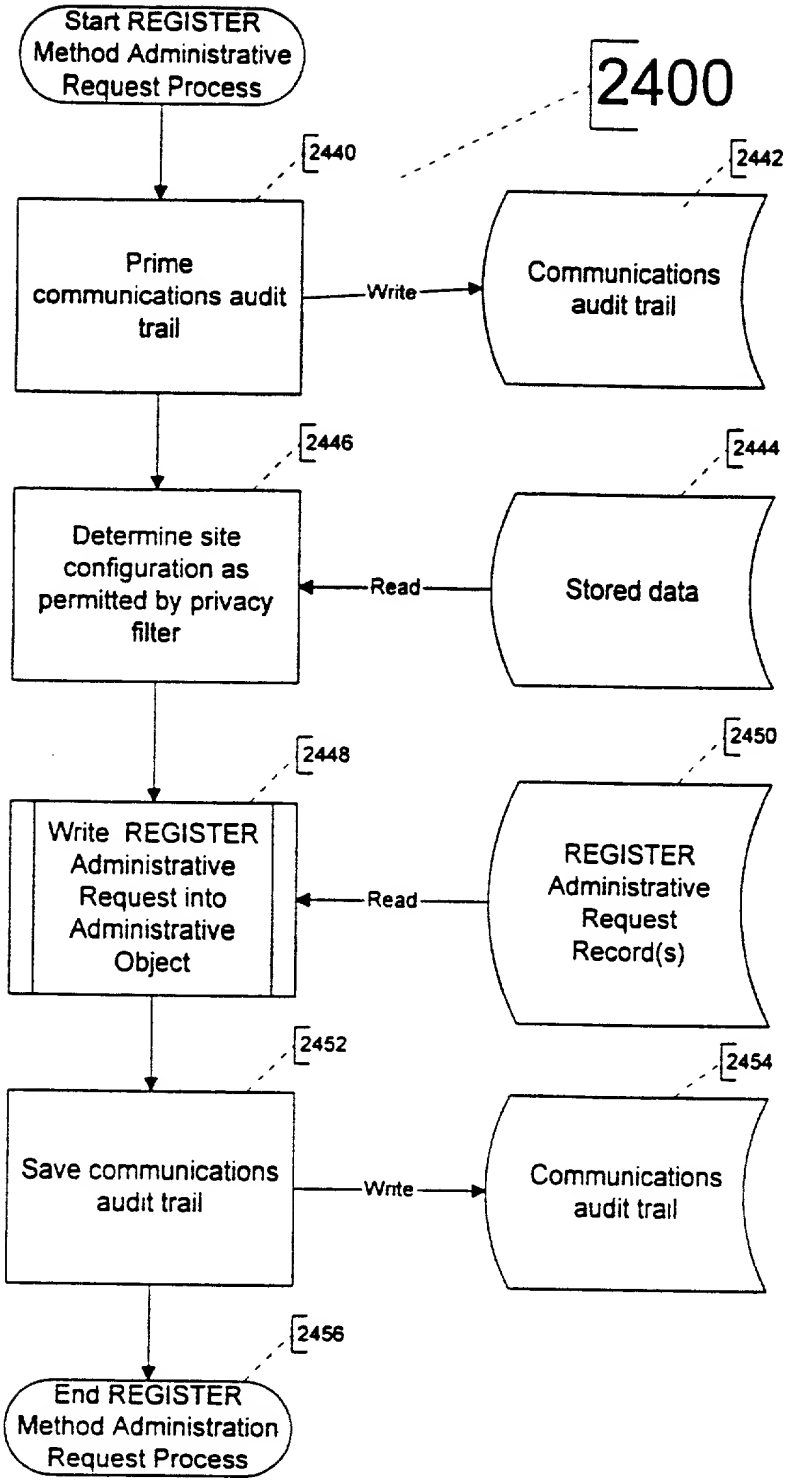


Figure 43b

REGISTER Method Administrative Response Process Flow

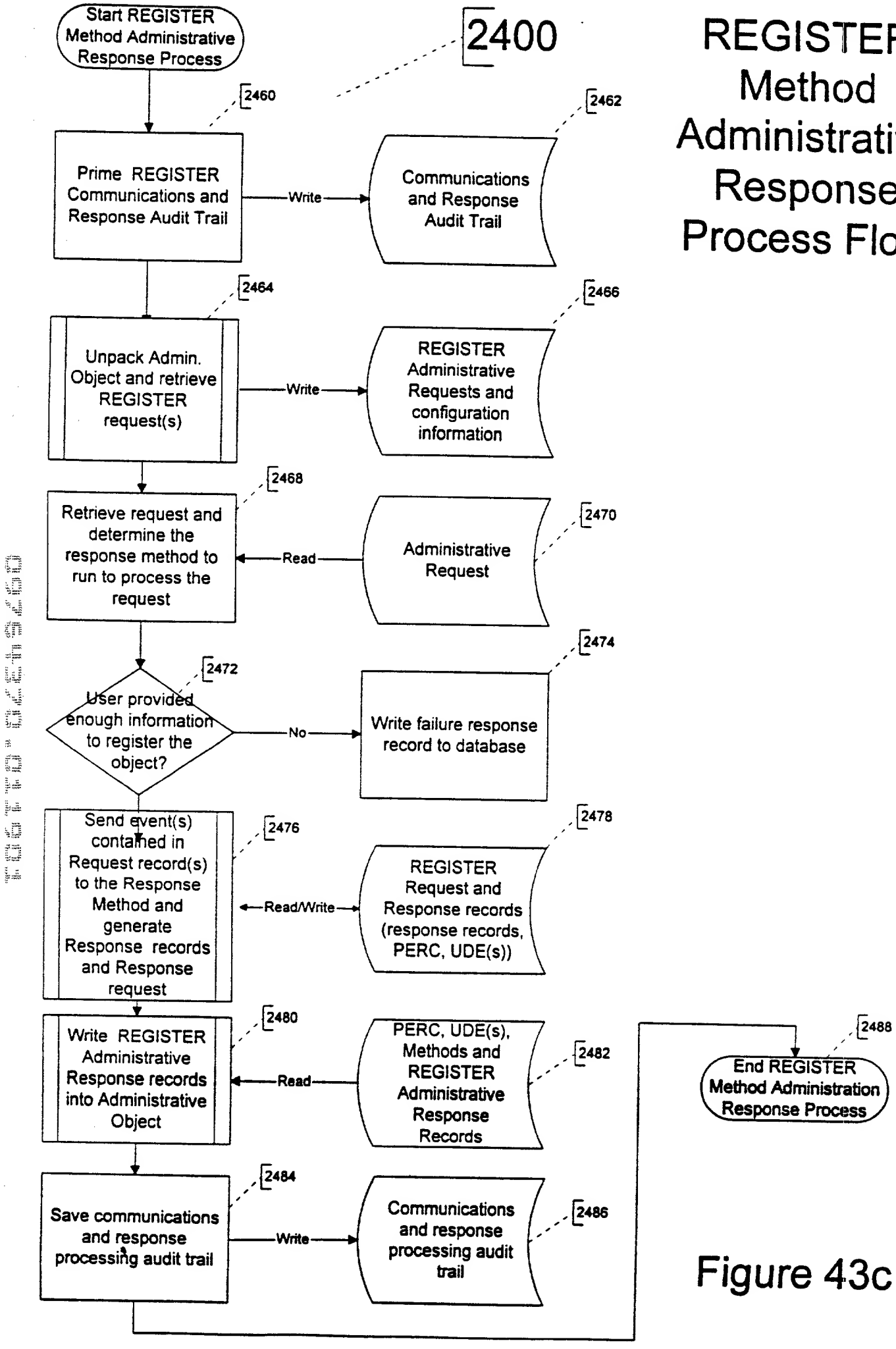


Figure 43c

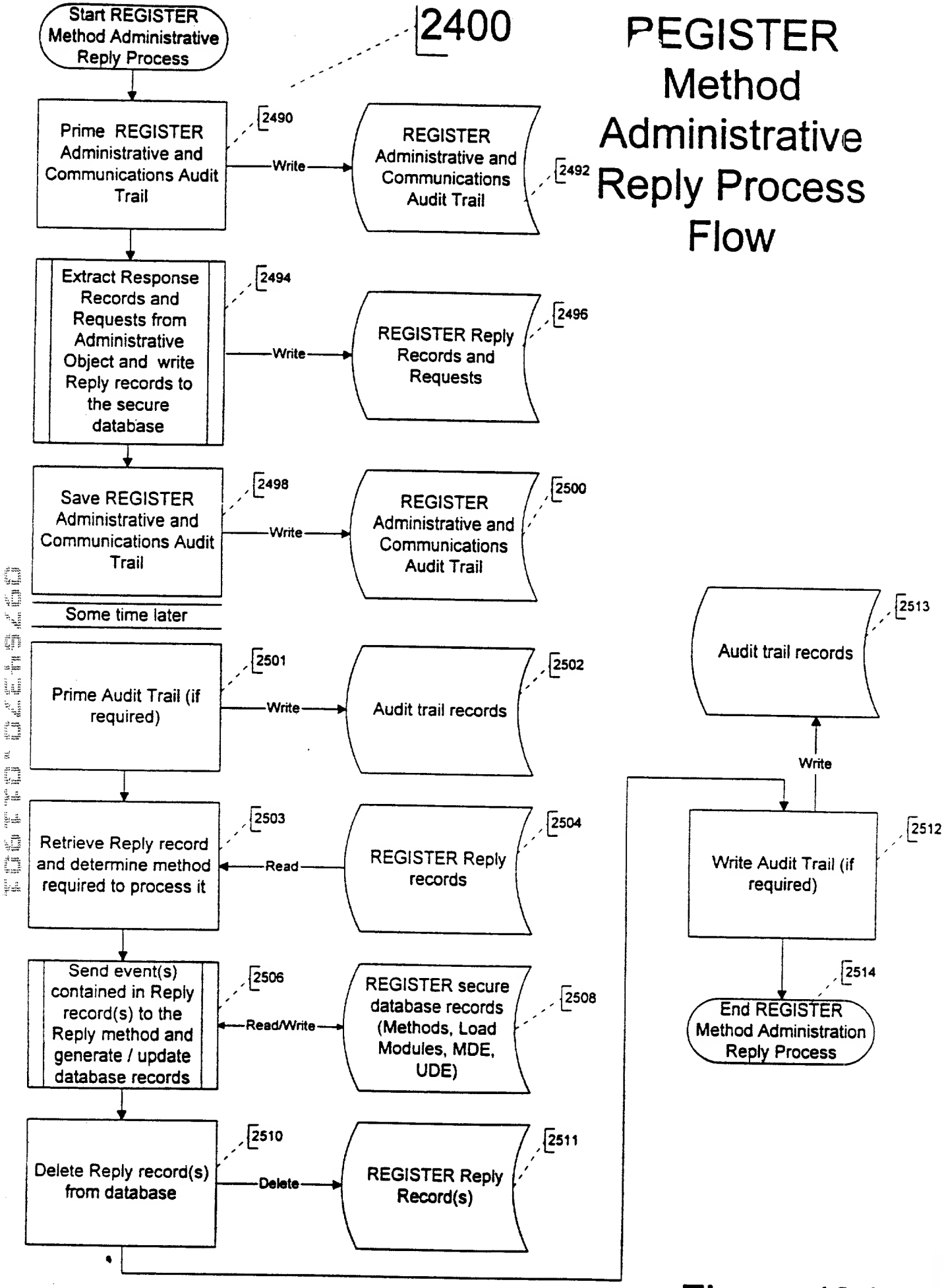

Start REGISTER Method Administrative Reply Process
2400
REGISTER Method Administrative Reply Process Flow
Prime REGISTER Administrative and Communications Audit Trail
2490
Write
REGISTER Administrative and Communications Audit Trail
2492
Extract Response Records and Requests from Administrative Object and write Reply records to the secure database
2494
Write
REGISTER Reply Records and Requests
2496
Save REGISTER Administrative and Communications Audit Trail
2498
Write
REGISTER Administrative and Communications Audit Trail
2500
Some time later
Prime Audit Trail (if required)
2501
Write
Audit trail records
2502
Retrieve Reply record and determine method required to process it
2503
Read
REGISTER Reply records
2504
Send event(s) contained in Reply record(s) to the Reply method and generate / update database records
2506
Read/Write
REGISTER secure database records (Methods, Load Modules, MDE, UDE)
2508
Delete Reply record(s) from database
2510
Delete
REGISTER Reply Record(s)
2511
Audit trail records
2513
Write
Write Audit Trail (if required)
2512
End REGISTER Method Administration Reply Process
2514

Figure 43d

AUDIT Method Administrative Request Process Flow

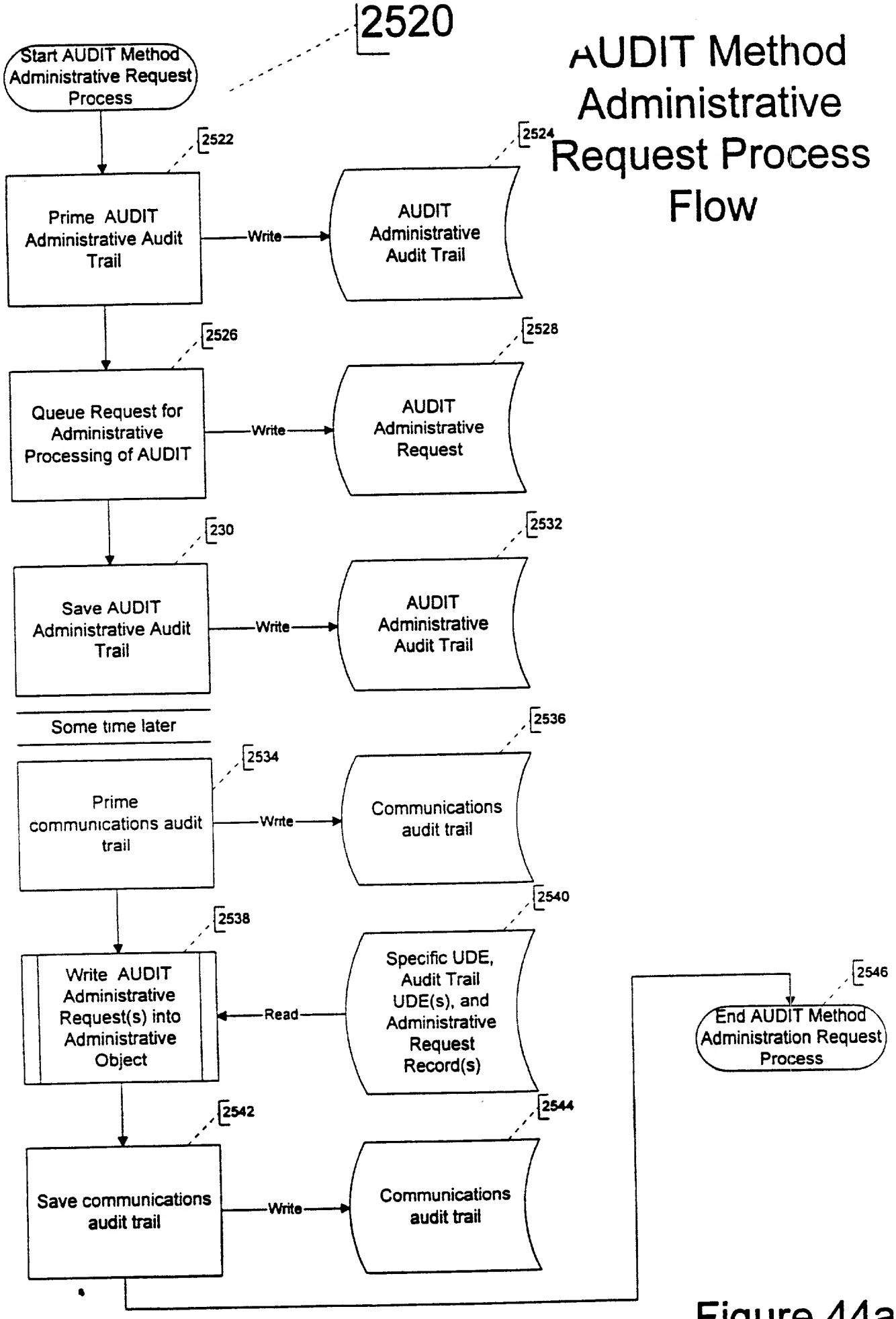


Figure 44a

AUDIT Method Administrative Response Process Flow

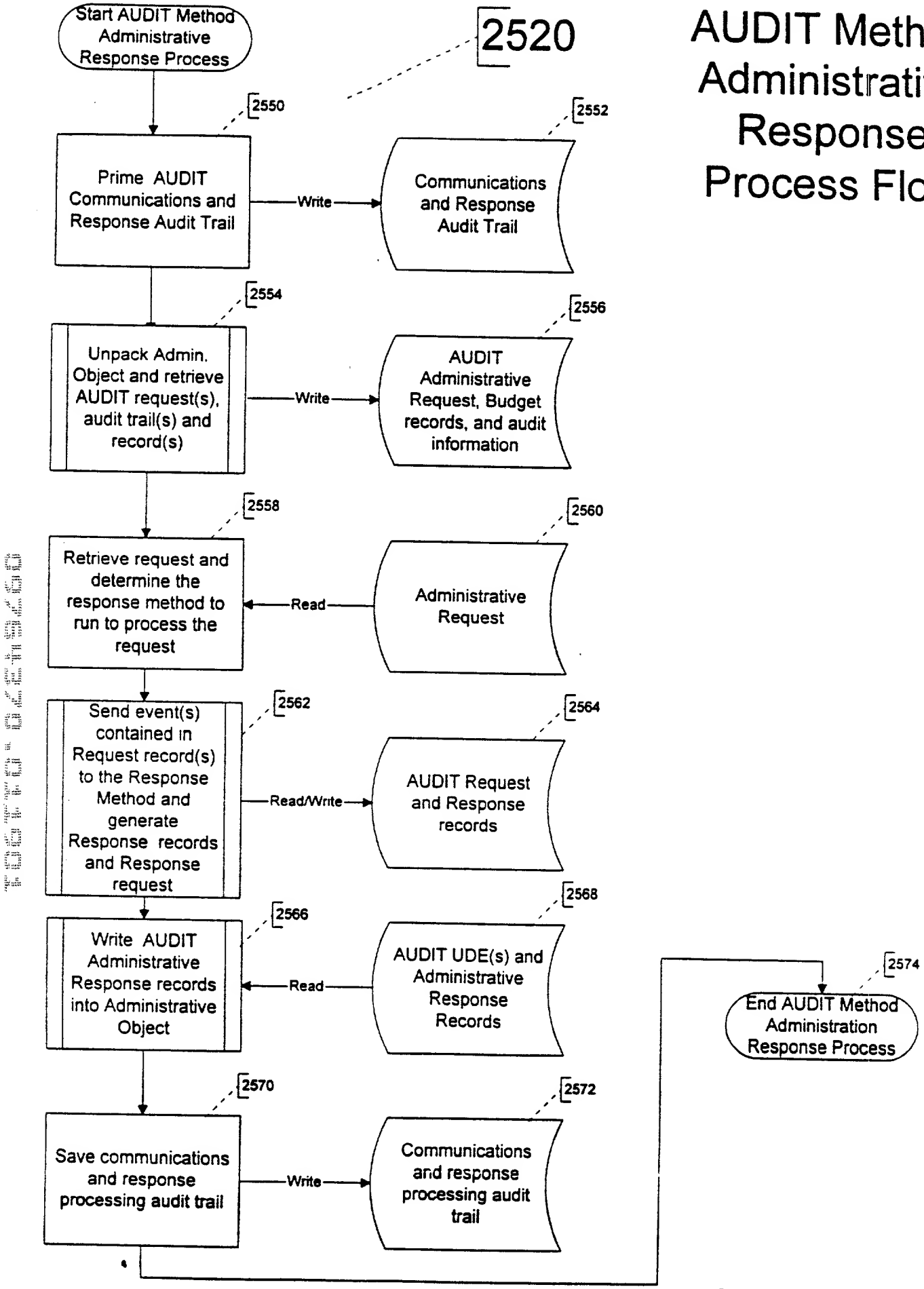


Figure 44b

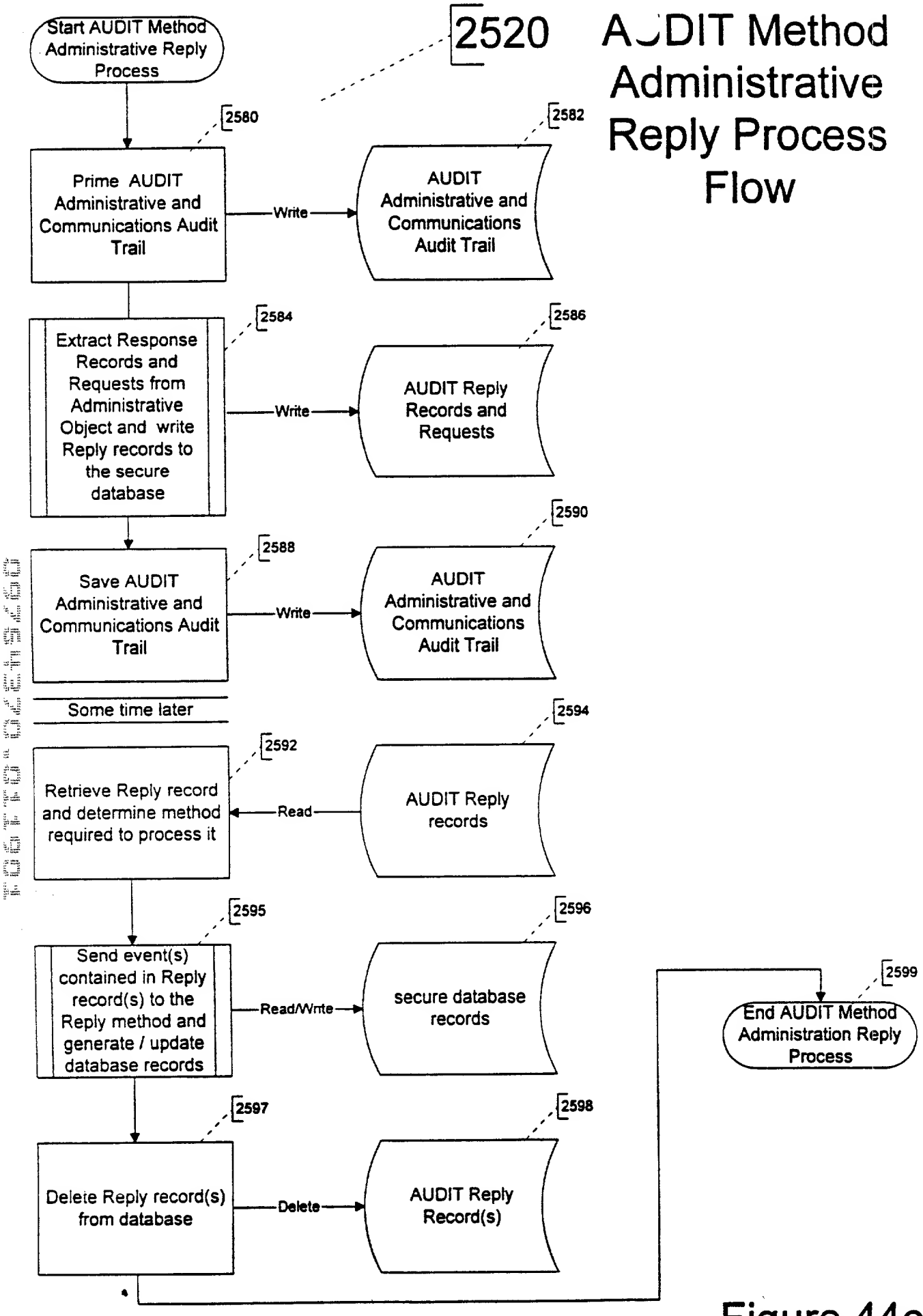

2520
AUDIT Method Administrative Reply Process Flow
Start AUDIT Method Administrative Reply Process
2580
Prime AUDIT Administrative and Communications Audit Trail
Write
2582
AUDIT Administrative and Communications Audit Trail
2584
Extract Response Records and Requests from Administrative Object and write Reply records to the secure database
Write
2586
AUDIT Reply Records and Requests
2588
Save AUDIT Administrative and Communications Audit Trail
Write
2590
AUDIT Administrative and Communications Audit Trail
Some time later
2592
Retrieve Reply record and determine method required to process it
Read
2594
AUDIT Reply records
2595
Send event(s) contained in Reply record(s) to the Reply method and generate / update database records
Read/Write
2596
secure database records
2597
Delete Reply record(s) from database
Delete
2598
AUDIT Reply Record(s)
2599
End AUDIT Method Administration Reply Process

Figure 44c

FIG. 45

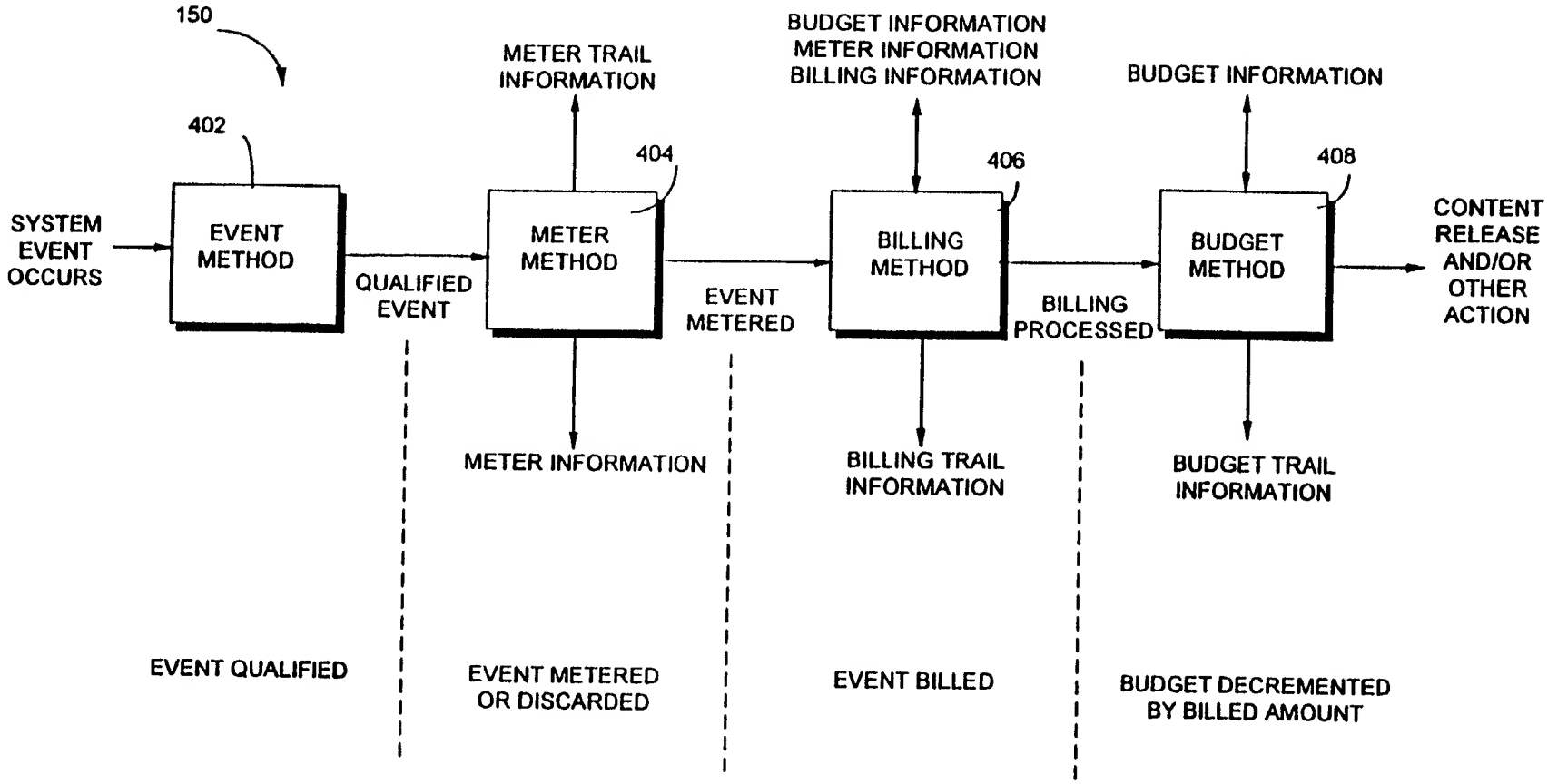
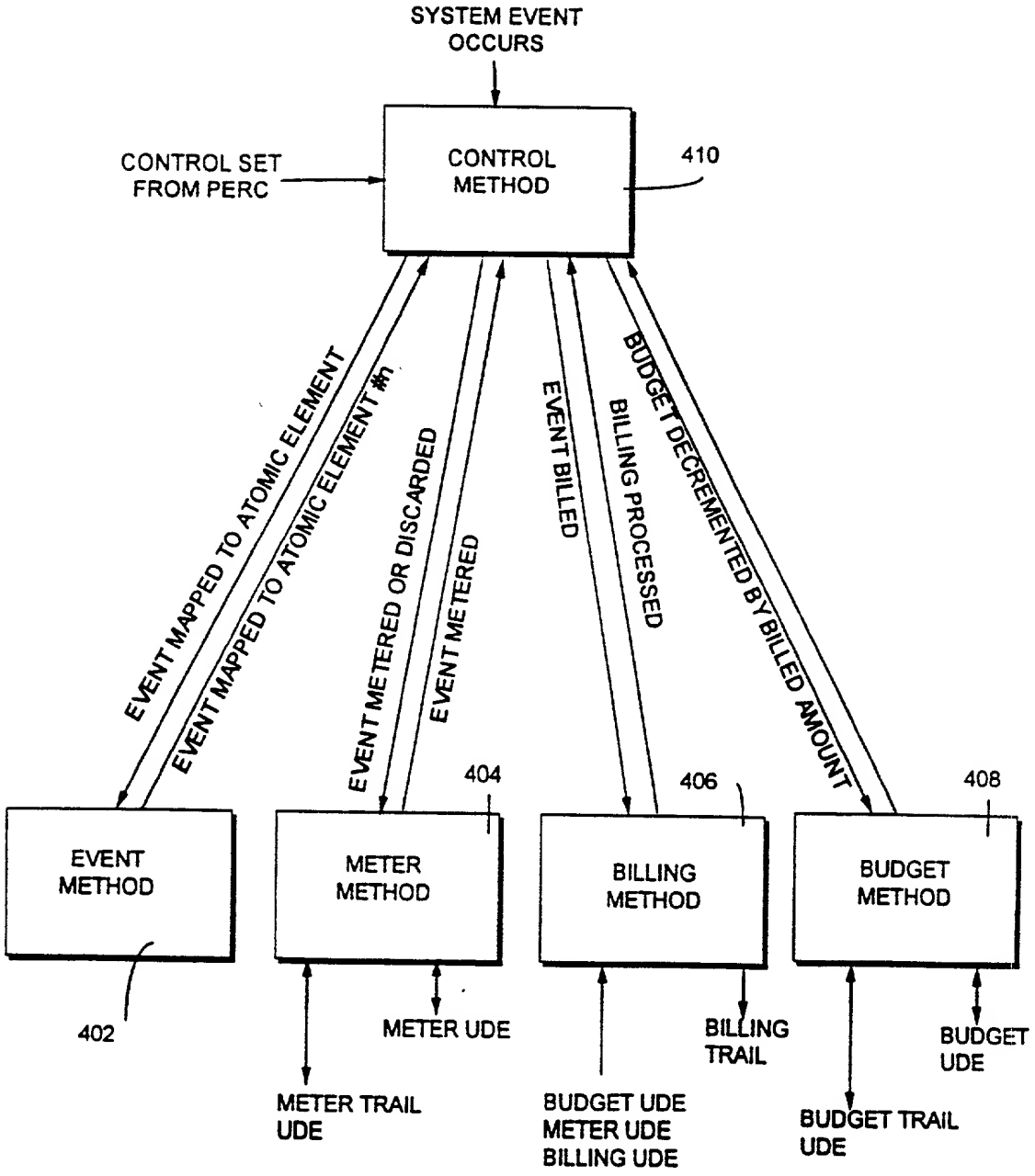
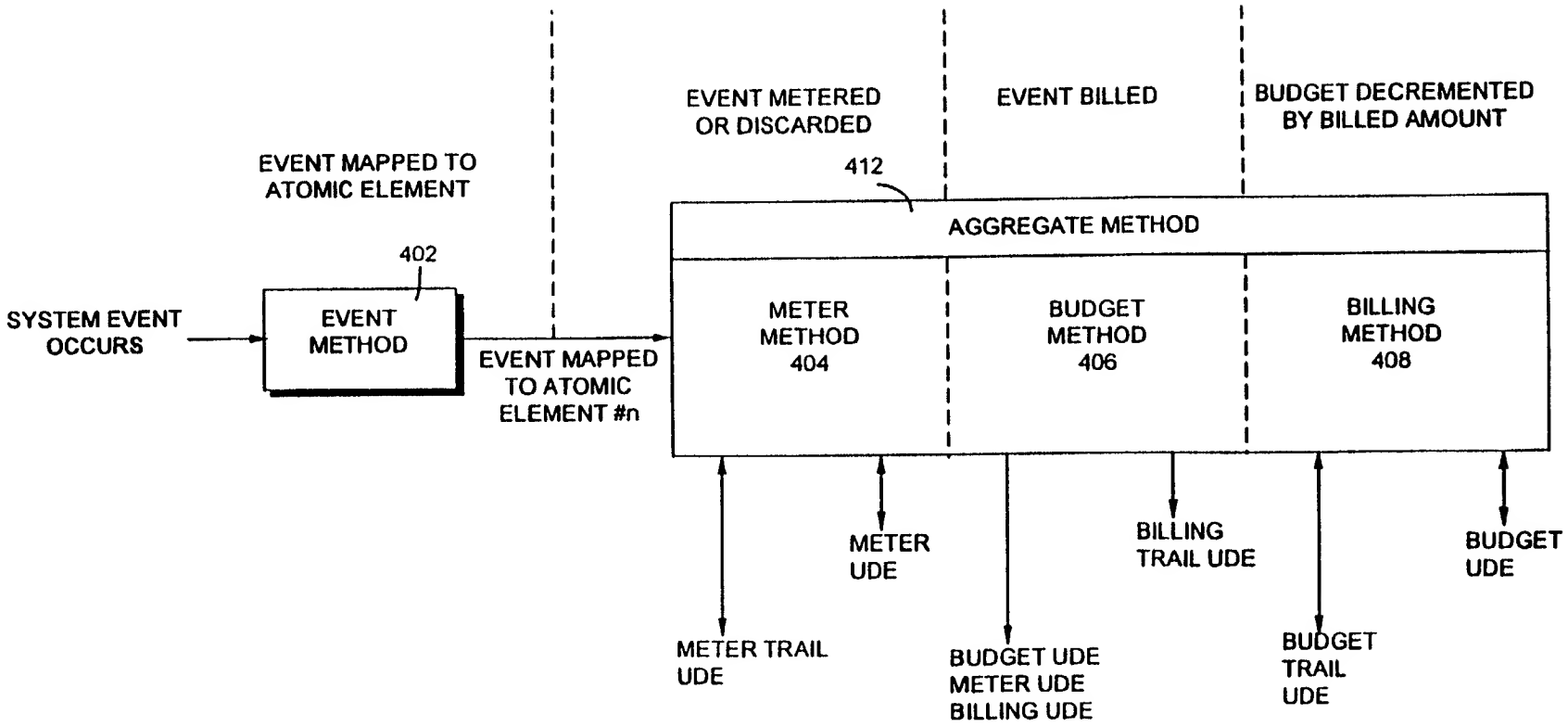

150
402
404
406
408
METER TRAIL INFORMATION
BUDGET INFORMATION METER INFORMATION BILLING INFORMATION
BUDGET INFORMATION
SYSTEM EVENT OCCURS
EVENT METHOD
QUALIFIED EVENT
METER METHOD
EVENT METERED
BILLING METHOD
BILLING PROCESSED
BUDGET METHOD
CONTENT RELEASE AND/OR OTHER ACTION
METER INFORMATION
BILLING TRAIL INFORMATION
BUDGET TRAIL INFORMATION
EVENT QUALIFIED
EVENT METERED OR DISCARDED
EVENT BILLED
BUDGET DECREMENTED BY BILLED AMOUNT

FIG. 46


SYSTEM EVENT OCCURS
CONTROL SET FROM PERC
CONTROL METHOD
410
EVENT MAPPED TO ATOMIC ELEMENT
EVENT MAPPED TO ATOMIC ELEMENT #1
EVENT METERED OR DISCARDED
EVENT METERED
EVENT BILLED
BILLING PROCESSED
BUDGET DECREMENTED BY BILLED AMOUNT
404
406
408
EVENT METHOD
METER METHOD
BILLING METHOD
BUDGET METHOD
402
METER UDE
METER TRAIL UDE
BUDGET UDE
METER UDE
BILLING UDE
BILLING TRAIL
BUDGET UDE
BUDGET TRAIL UDE

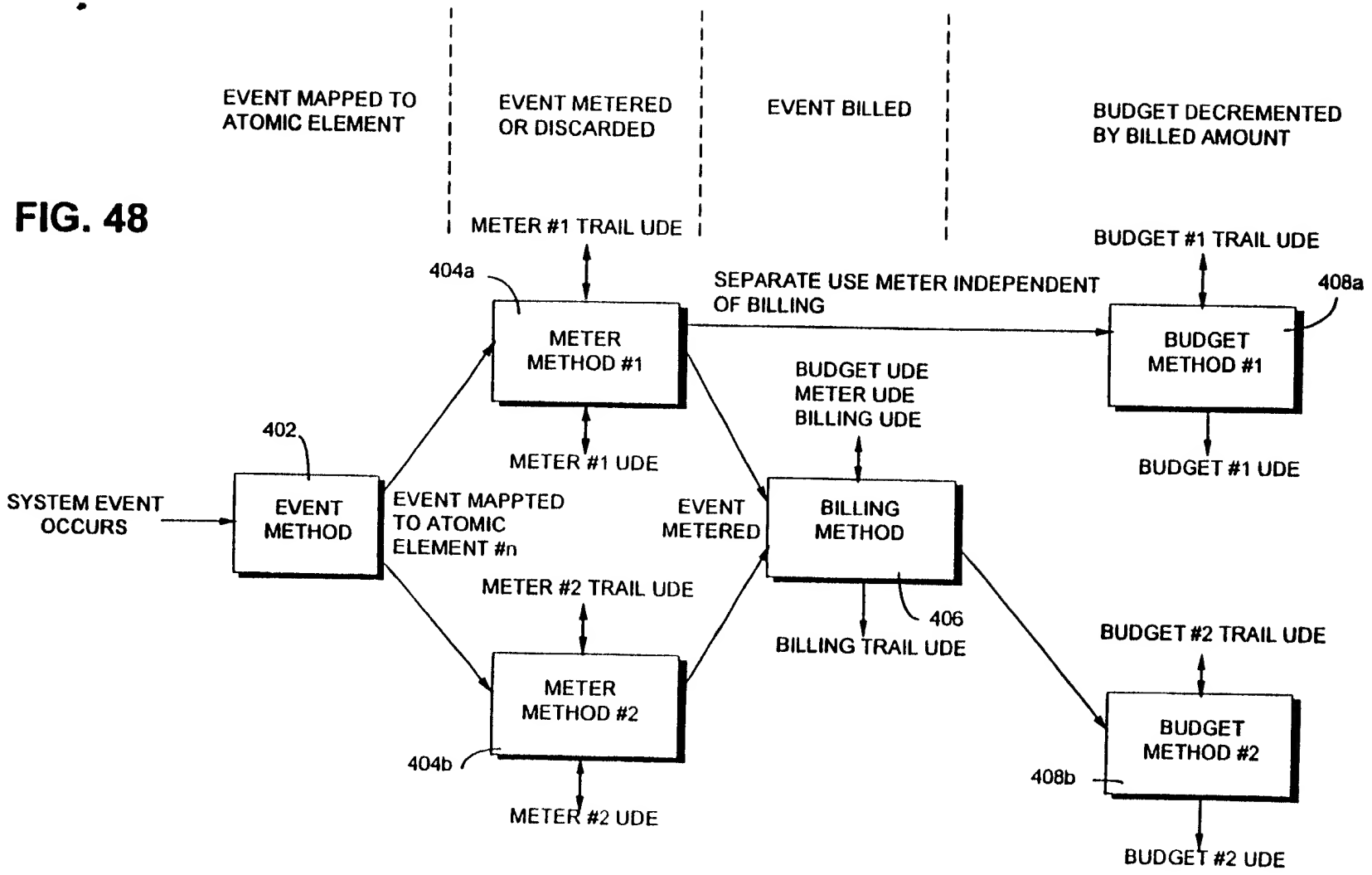
Docket Search

FIG. 47



TOP SECRET//SCI

FIG. 48



OPEN Method Use Process Flow

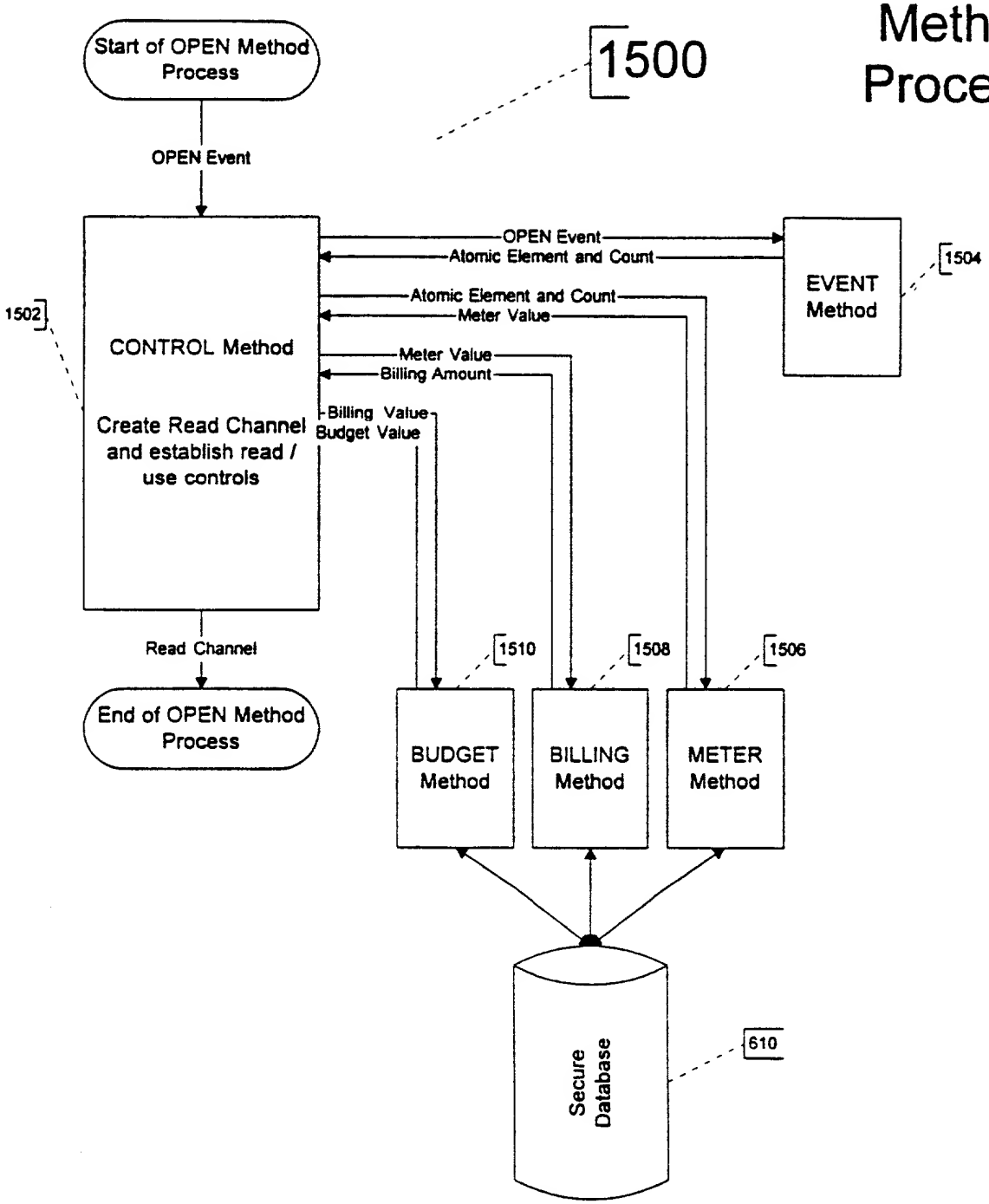


Figure 49

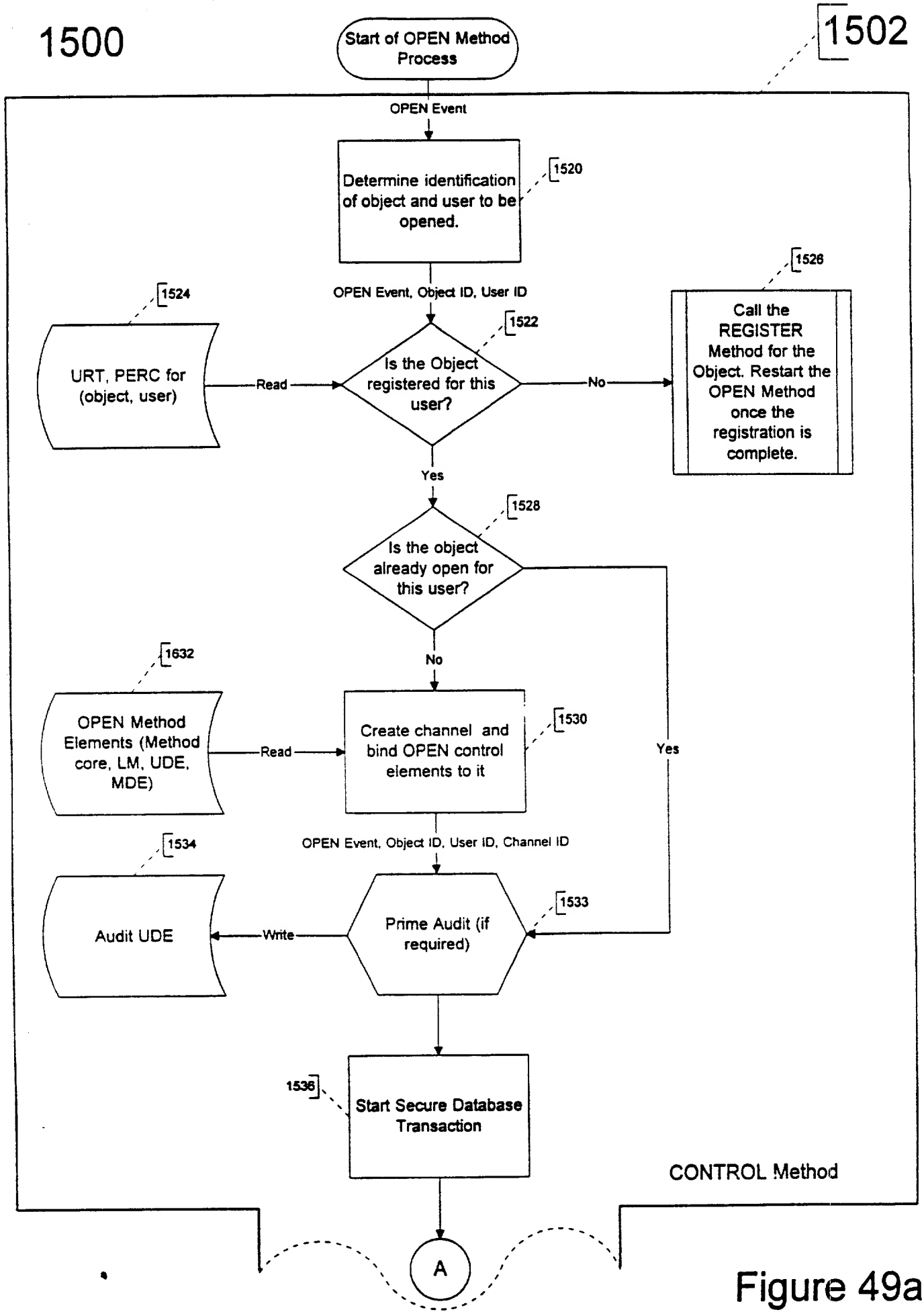

1500
1502
Start of OPEN Method Process
OPEN Event
Determine identification of object and user to be opened.
1520
OPEN Event, Object ID, User ID
1524
URT, PERC for (object, user)
Read
1522
Is the Object registered for this user?
No
1526
Call the REGISTER Method for the Object. Restart the OPEN Method once the registration is complete.
Yes
1528
Is the object already open for this user?
No
Yes
1632
OPEN Method Elements (Method core, LM, UDE, MDE)
Read
Create channel and bind OPEN control elements to it
1530
OPEN Event, Object ID, User ID, Channel ID
1534
Audit UDE
Write
Prime Audit (if required)
1533
1536
Start Secure Database Transaction
CONTROL Method
A

Figure 49a

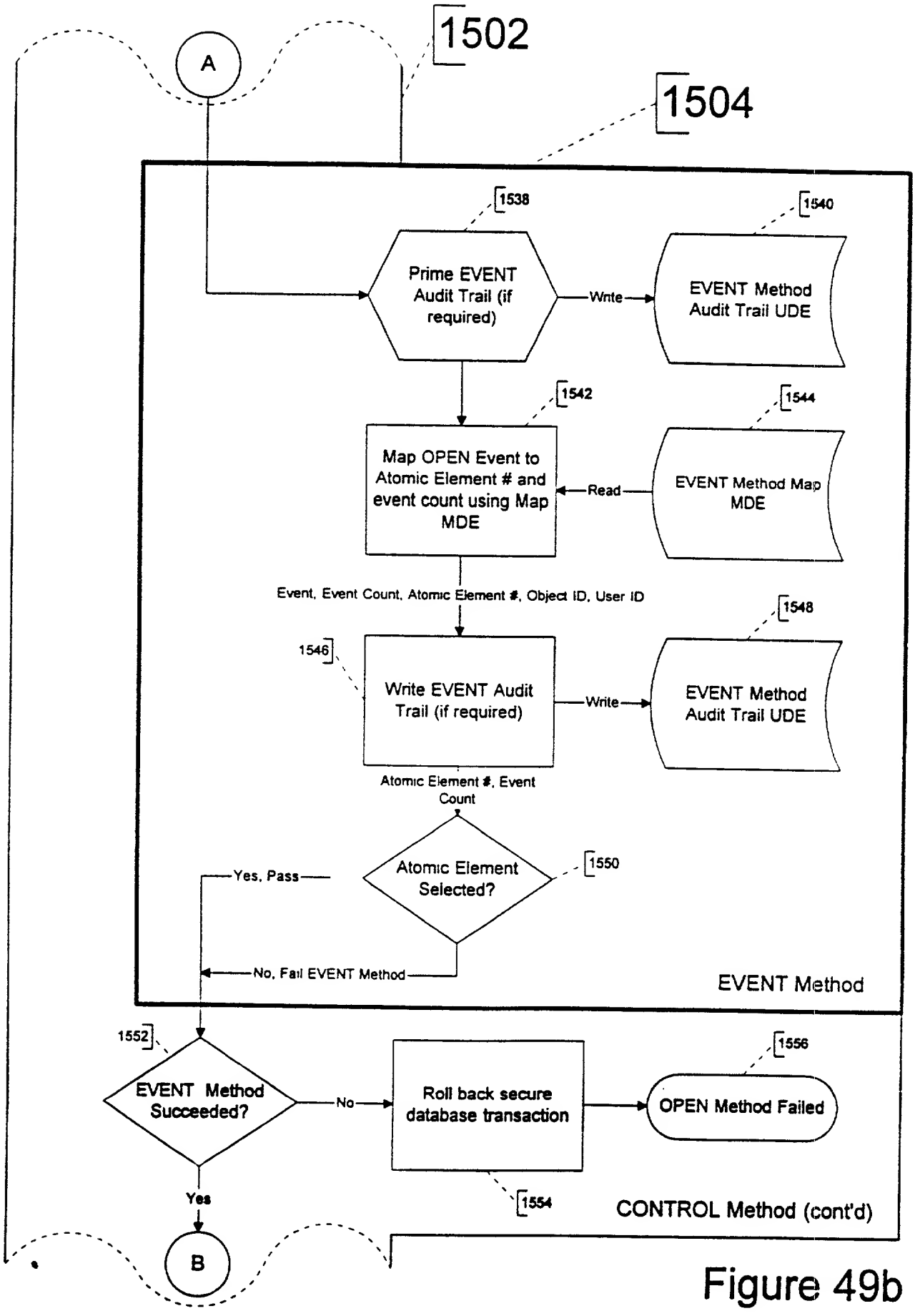

A
1502
1504
1538
Prime EVENT Audit Trail (if required)
Write
1540
EVENT Method Audit Trail UDE
1542
Map OPEN Event to Atomic Element # and event count using Map MDE
Read
1544
EVENT Method Map MDE
Event, Event Count, Atomic Element #, Object ID, User ID
1546
Write EVENT Audit Trail (if required)
Write
1548
EVENT Method Audit Trail UDE
Atomic Element #, Event Count
Atomic Element Selected?
1550
Yes, Pass
No, Fail EVENT Method
EVENT Method
1552
EVENT Method Succeeded?
No
Roll back secure database transaction
1554
1556
OPEN Method Failed
Yes
CONTROL Method (cont'd)
B

Figure 49b

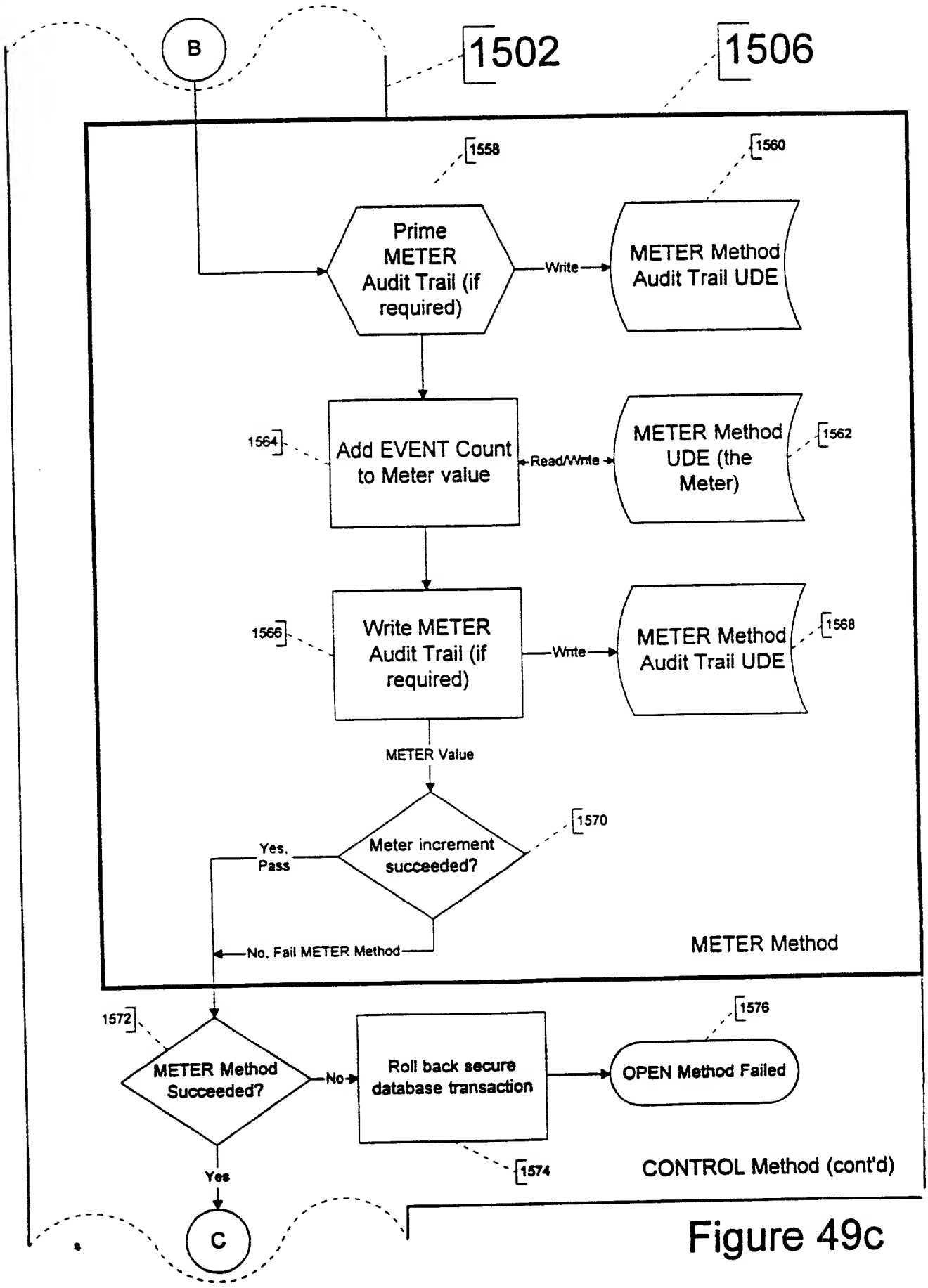

B
1502
1506
1558
1560
Prime METER Audit Trail (if required)
Write
METER Method Audit Trail UDE
1564
Add EVENT Count to Meter value
Read/Write
METER Method UDE (the Meter)
1562
1566
Write METER Audit Trail (if required)
Write
METER Method Audit Trail UDE
1568
METER Value
1570
Meter increment succeeded?
Yes, Pass
No, Fail METER Method
METER Method
1572
METER Method Succeeded?
No
Roll back secure database transaction
1576
OPEN Method Failed
1574
CONTROL Method (cont'd)
Yes
C

Figure 49c

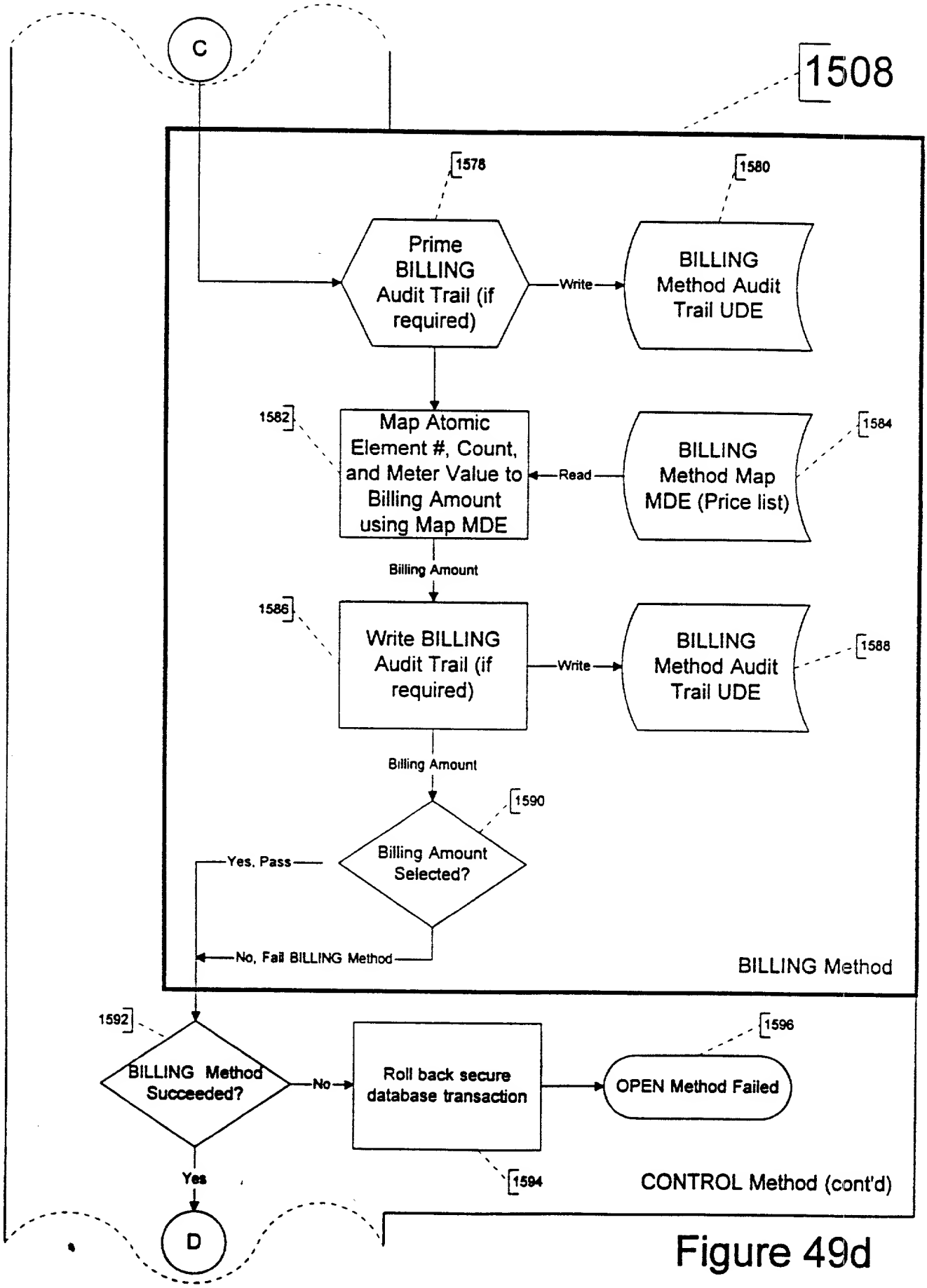

C
1508
1578
1580
Prime BILLING Audit Trail (if required)
Write
BILLING Method Audit Trail UDE
1582
Map Atomic Element #, Count, and Meter Value to Billing Amount using Map MDE
Read
BILLING Method Map MDE (Price list)
1584
Billing Amount
1586
Write BILLING Audit Trail (if required)
Write
BILLING Method Audit Trail UDE
1588
Billing Amount
1590
Billing Amount Selected?
Yes, Pass
No, Fail BILLING Method
BILLING Method
1592
BILLING Method Succeeded?
No
Roll back secure database transaction
1596
OPEN Method Failed
1594
Yes
CONTROL Method (cont'd)
D

Figure 49d

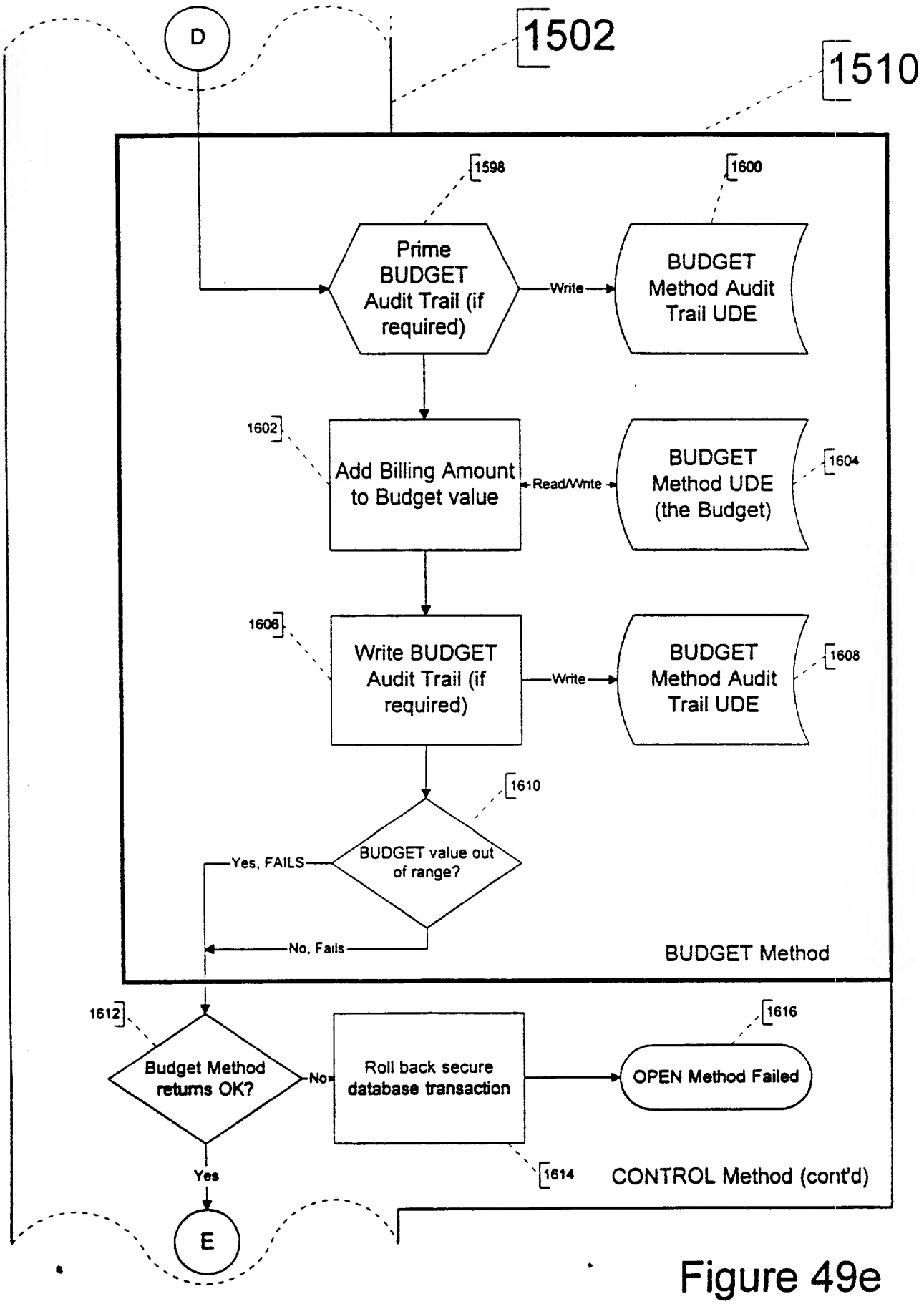

D
1502
1510
1598
1600
Prime BUDGET Audit Trail (if required)
Write
BUDGET Method Audit Trail UDE
1602
Add Billing Amount to Budget value
Read/Write
BUDGET Method UDE (the Budget)
1604
1606
Write BUDGET Audit Trail (if required)
Write
BUDGET Method Audit Trail UDE
1608
1610
BUDGET value out of range?
Yes, FAILS
No, Fails
BUDGET Method
1612
Budget Method returns OK?
No
Roll back secure database transaction
1616
OPEN Method Failed
Yes
1614
CONTROL Method (cont'd)
E

Figure 49e

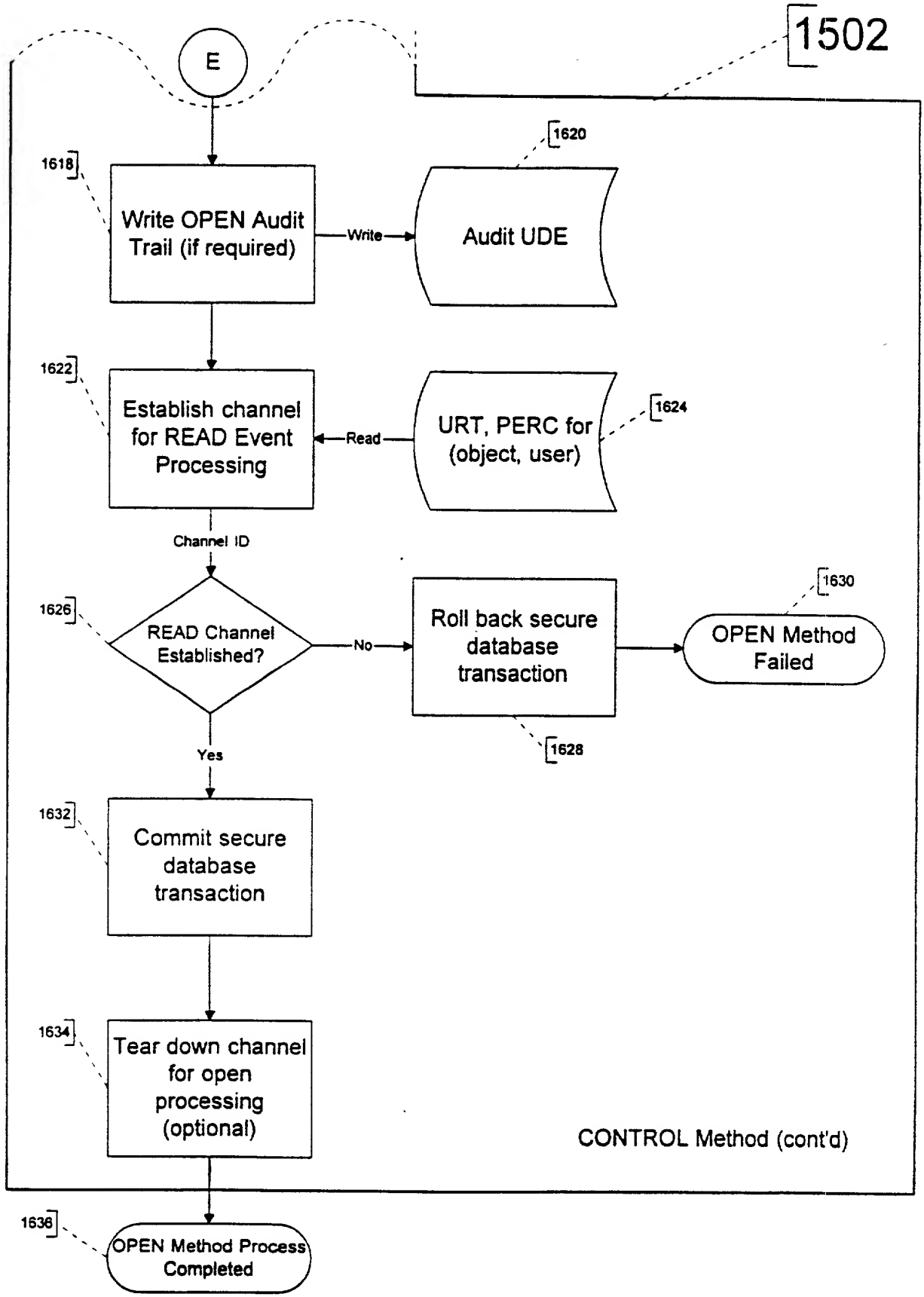

1502
E
1618
Write OPEN Audit Trail (if required)
Write
1620
Audit UDE
1622
Establish channel for READ Event Processing
Read
URT, PERC for (object, user)
1624
Channel ID
1626
READ Channel Established?
No
Roll back secure database transaction
1628
1630
OPEN Method Failed
Yes
1632
Commit secure database transaction
1634
Tear down channel for open processing (optional)
CONTROL Method (cont'd)
1636
OPEN Method Process Completed

Figure 49f

READ Method Use Process Flow

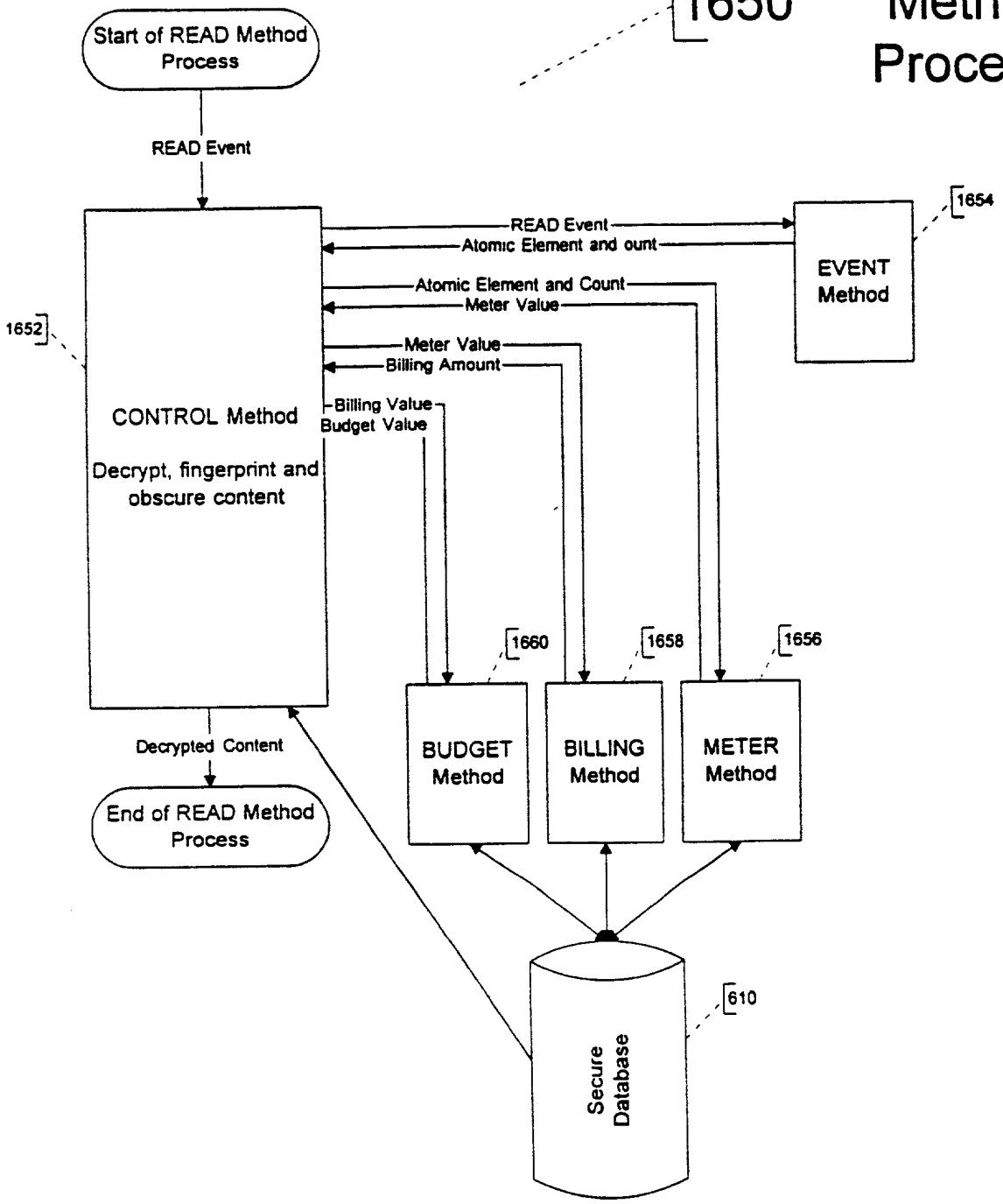


Figure 50

1650

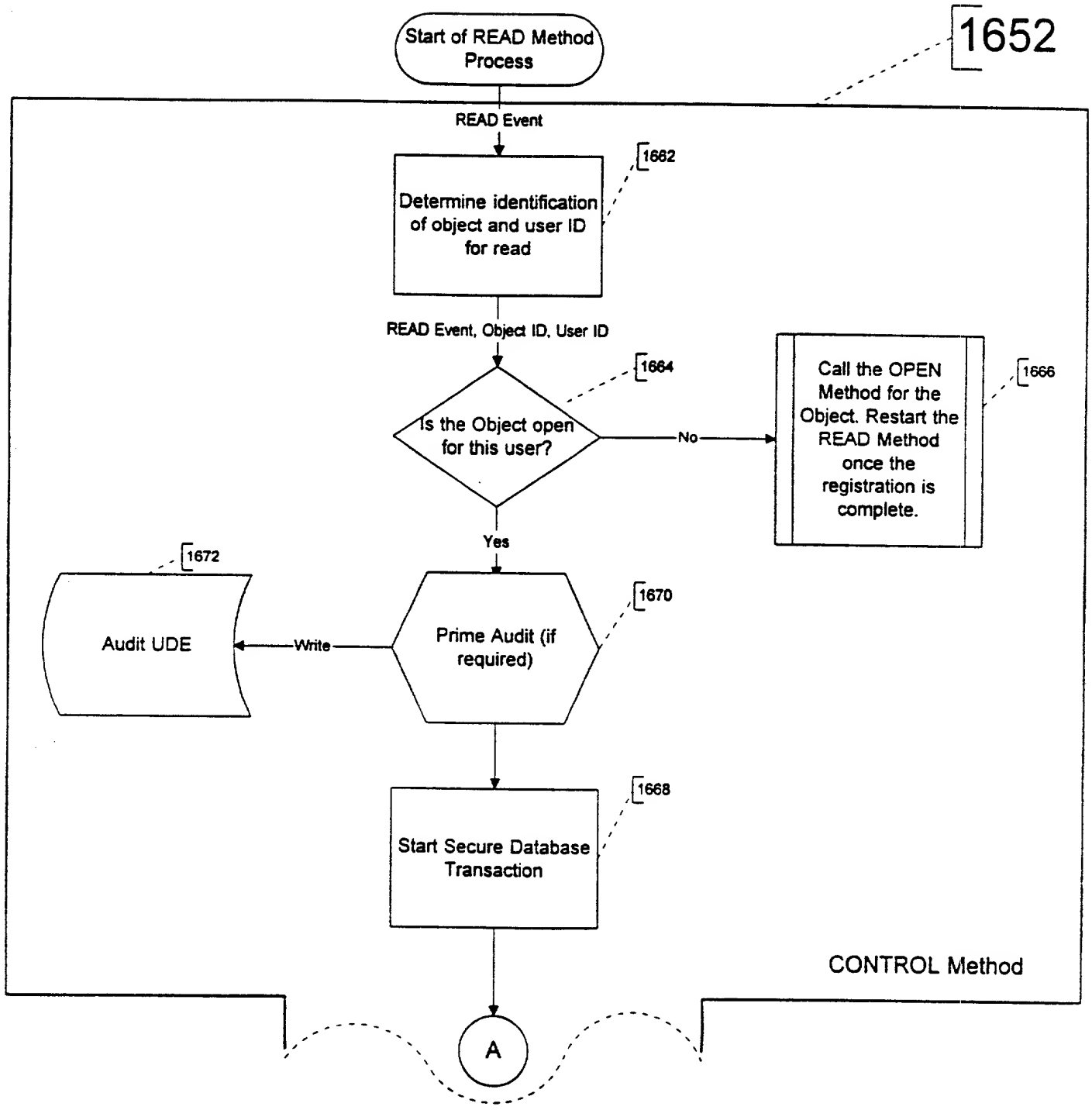


Figure 50a

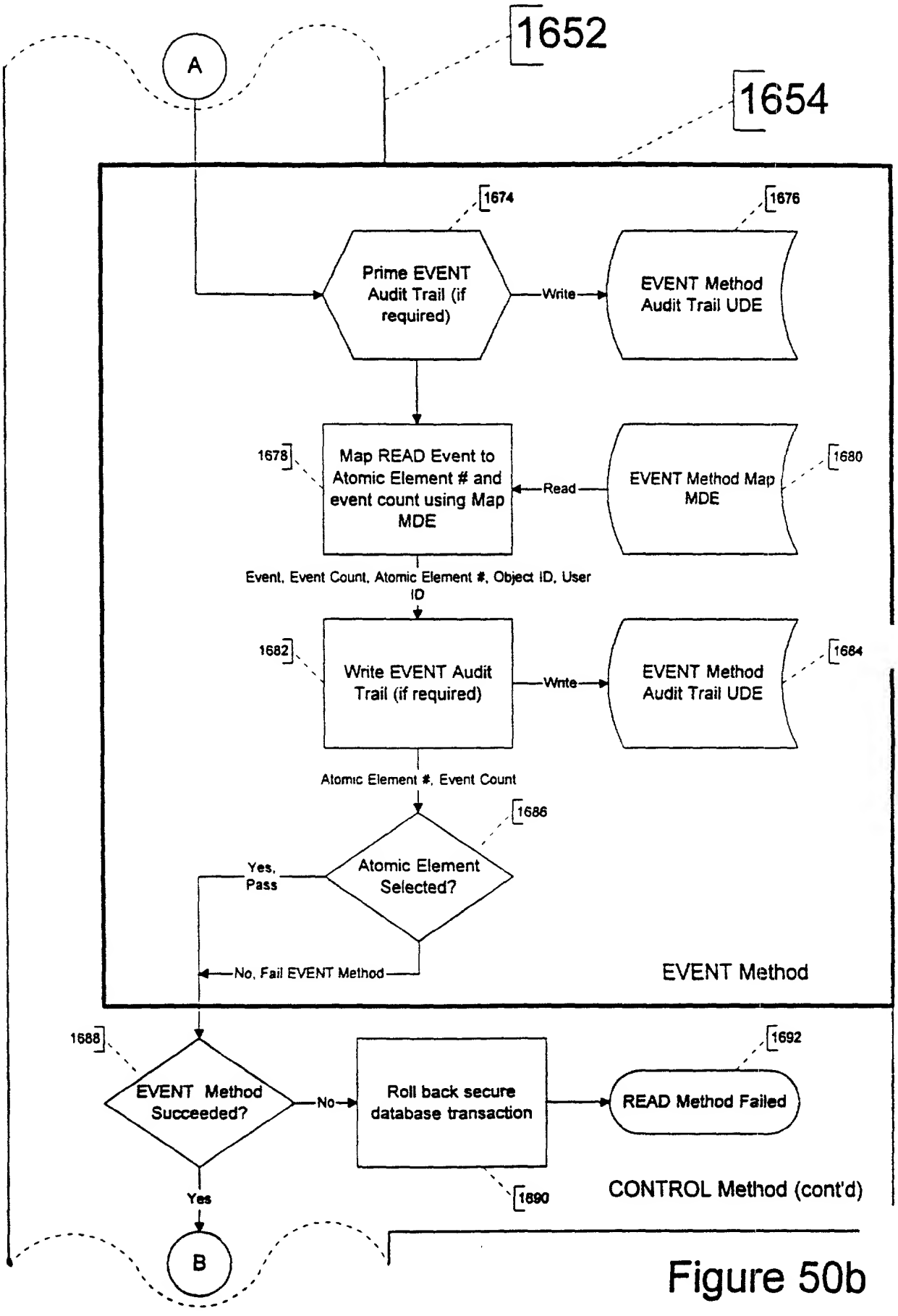

A
1652
1654
1674
1676
Prime EVENT Audit Trail (if required)
Write
EVENT Method Audit Trail UDE
1678
Map READ Event to Atomic Element # and event count using Map MDE
Read
EVENT Method Map MDE
1680
Event, Event Count, Atomic Element #, Object ID, User ID
1682
Write EVENT Audit Trail (if required)
Write
EVENT Method Audit Trail UDE
1684
Atomic Element #, Event Count
1686
Atomic Element Selected?
Yes, Pass
No, Fail EVENT Method
EVENT Method
1688
EVENT Method Succeeded?
No
Roll back secure database transaction
1690
1692
READ Method Failed
Yes
CONTROL Method (cont'd)
B

Figure 50b

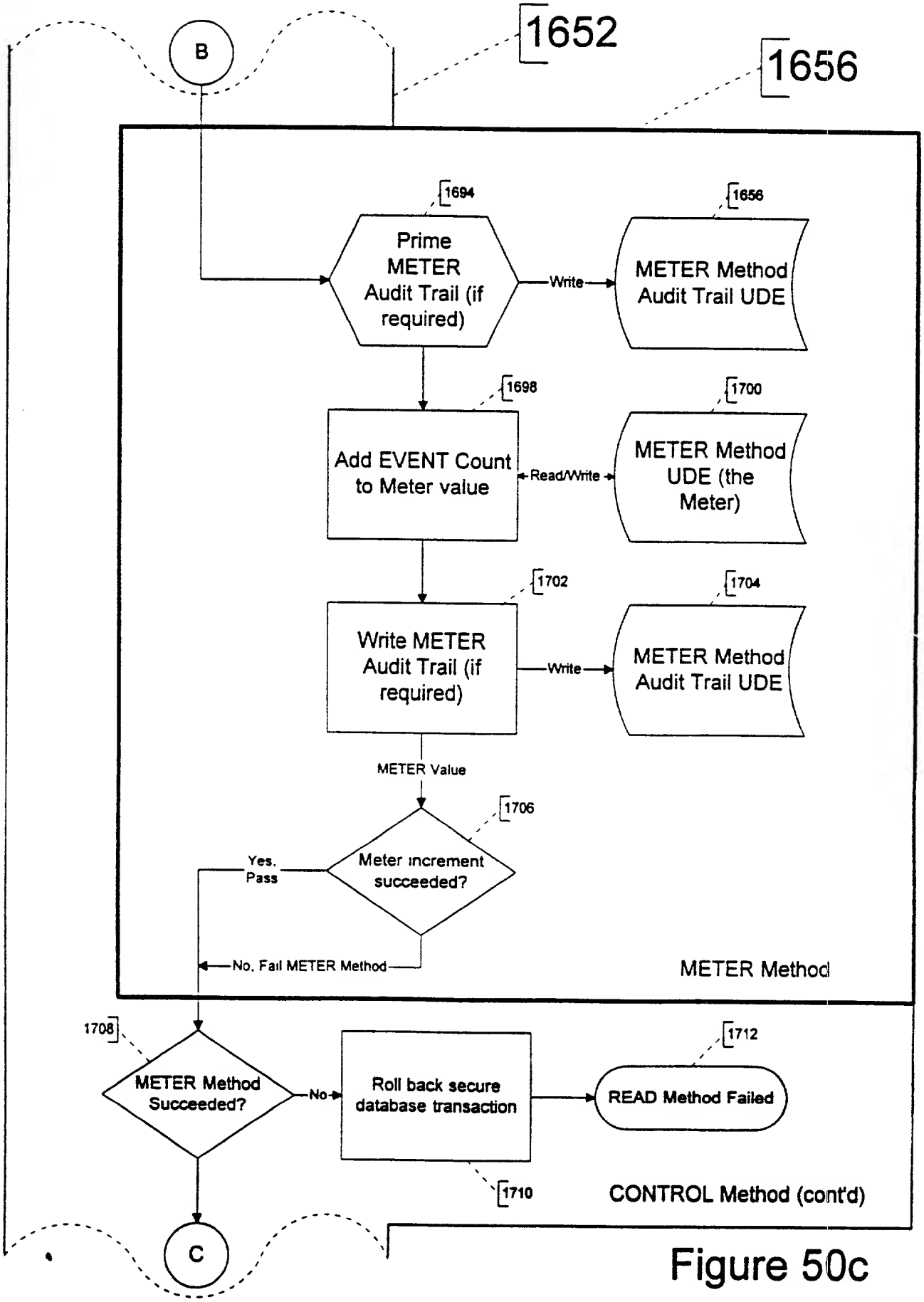

B
1652
1656
1694
Prime METER Audit Trail (if required)
Write
1656
METER Method Audit Trail UDE
1698
Add EVENT Count to Meter value
Read/Write
1700
METER Method UDE (the Meter)
1702
Write METER Audit Trail (if required)
Write
1704
METER Method Audit Trail UDE
METER Value
1706
Meter increment succeeded?
Yes, Pass
No, Fail METER Method
METER Method
1708
METER Method Succeeded?
No
Roll back secure database transaction
1712
READ Method Failed
1710
CONTROL Method (cont'd)
C

Figure 50c

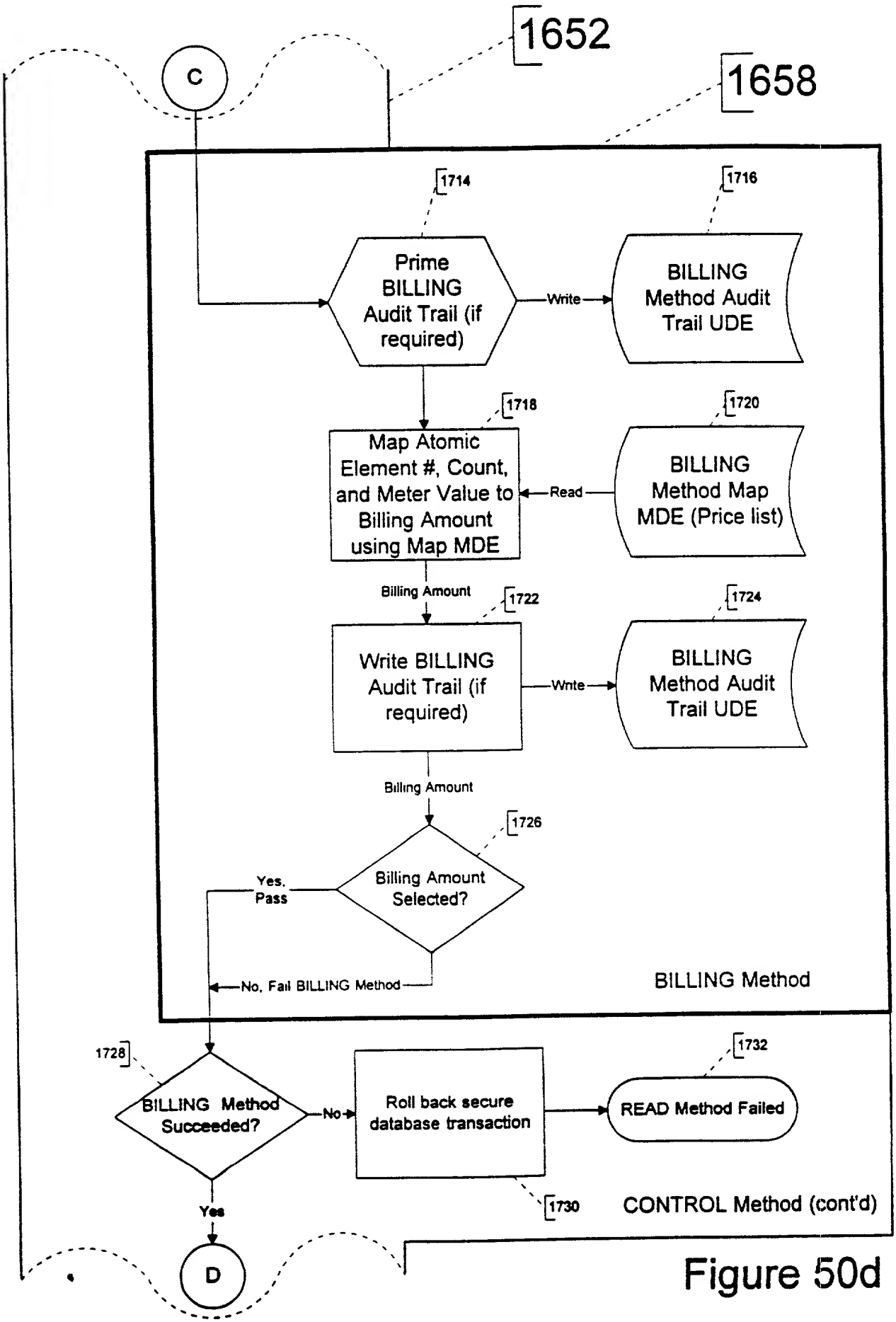

1652
1658
C
1714
Prime BILLING Audit Trail (if required)
Write
1716
BILLING Method Audit Trail UDE
1718
Map Atomic Element #, Count, and Meter Value to Billing Amount using Map MDE
Read
1720
BILLING Method Map MDE (Price list)
Billing Amount
1722
Write BILLING Audit Trail (if required)
Write
1724
BILLING Method Audit Trail UDE
Billing Amount
1726
Billing Amount Selected?
Yes, Pass
No, Fail BILLING Method
BILLING Method
1728
BILLING Method Succeeded?
No
Roll back secure database transaction
1730
1732
READ Method Failed
Yes
CONTROL Method (cont'd)
D

Figure 50d

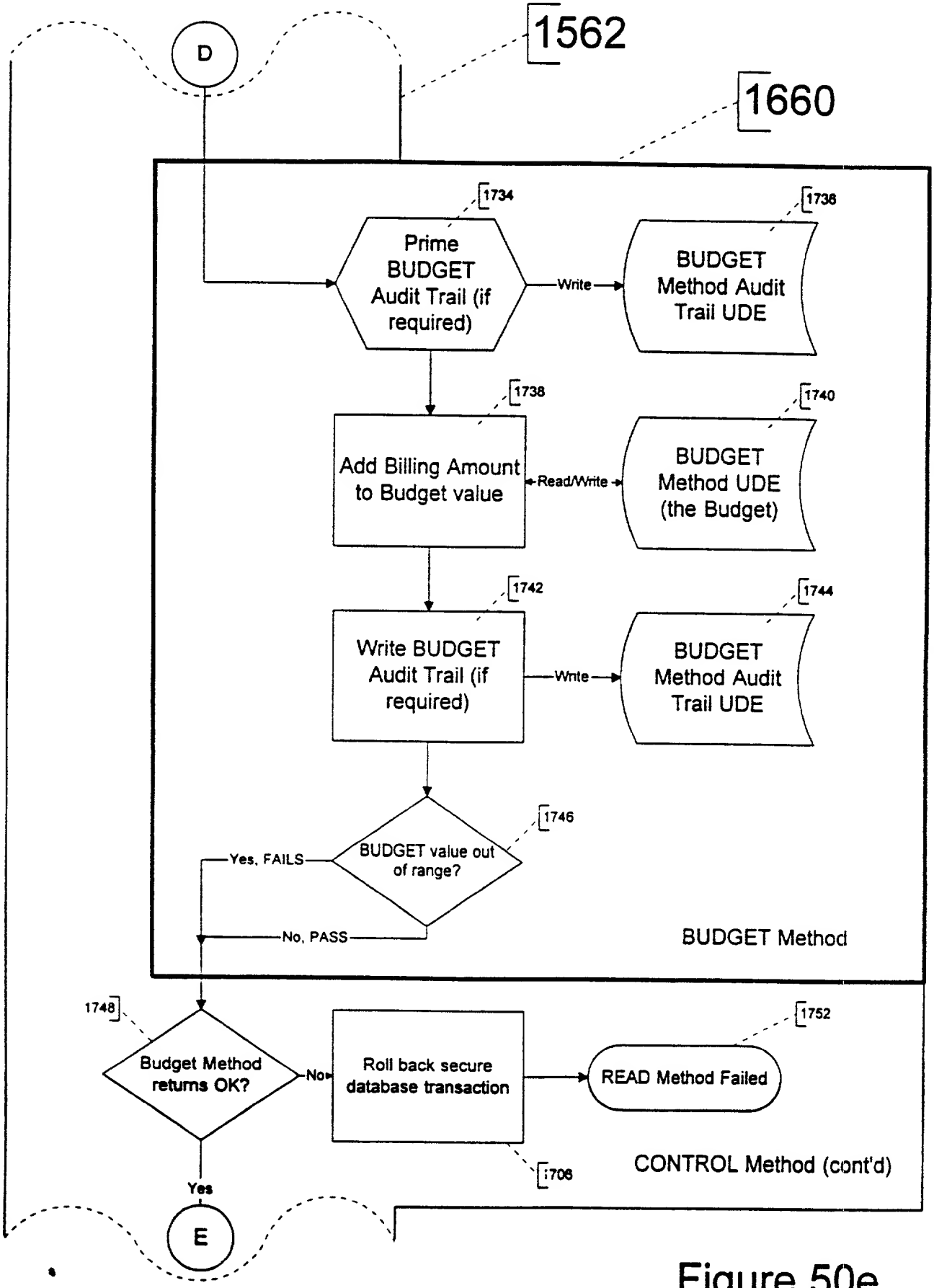
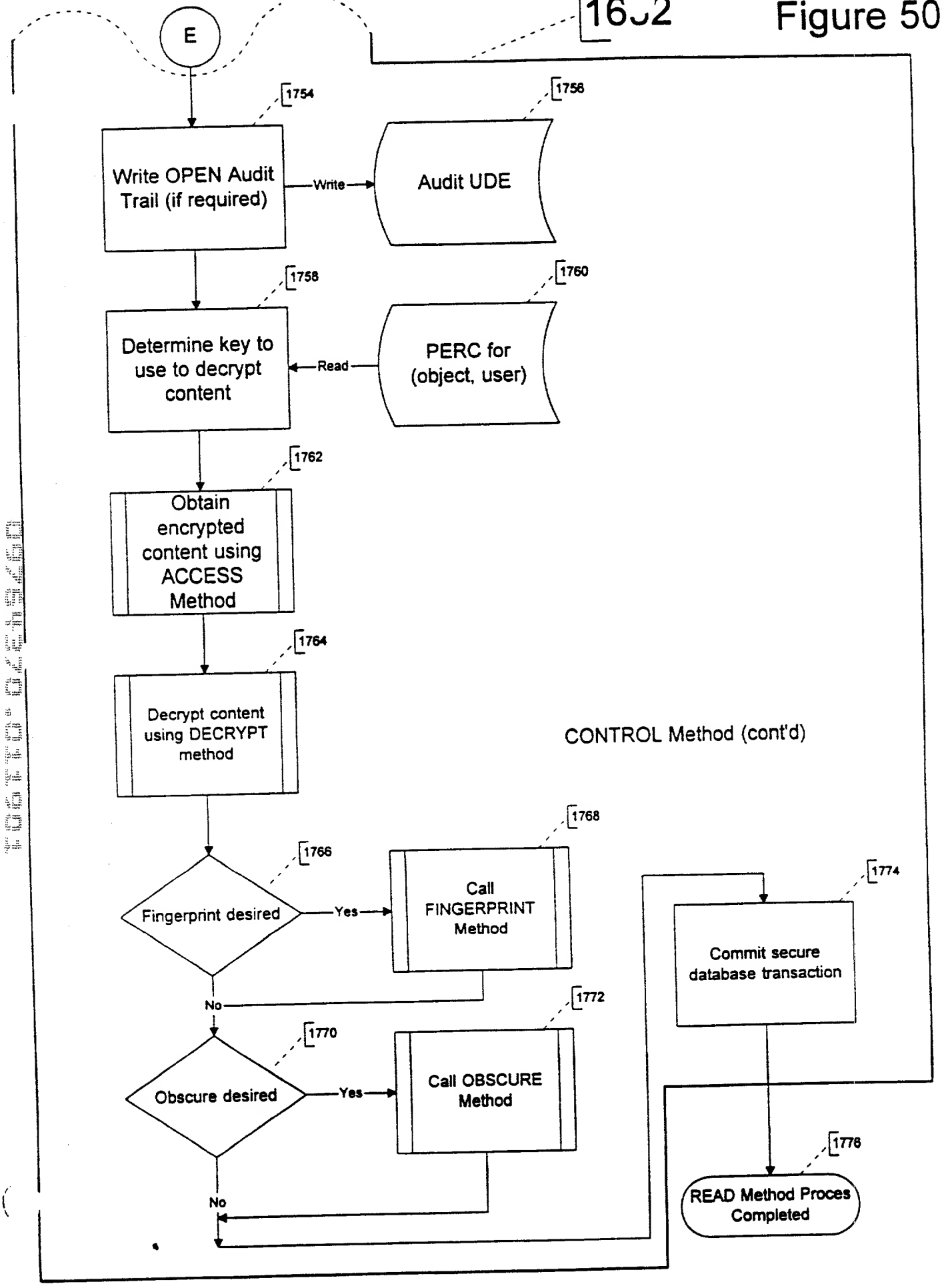

D
1562
1660
1734
Prime BUDGET Audit Trail (if required)
Write
1736
BUDGET Method Audit Trail UDE
1738
Add Billing Amount to Budget value
Read/Write
1740
BUDGET Method UDE (the Budget)
1742
Write BUDGET Audit Trail (if required)
Write
1744
BUDGET Method Audit Trail UDE
1746
BUDGET value out of range?
Yes, FAILS
No, PASS
BUDGET Method
1748
Budget Method returns OK?
No
Roll back secure database transaction
1752
READ Method Failed
1706
CONTROL Method (cont'd)
Yes
E

Figure 50e

Figure 50f


E
1754
Write OPEN Audit Trail (if required)
Write
1756
Audit UDE
1758
Determine key to use to decrypt content
Read
1760
PERC for (object, user)
1762
Obtain encrypted content using ACCESS Method
1764
Decrypt content using DECRYPT method
CONTROL Method (cont'd)
1766
Fingerprint desired
Yes
1768
Call FINGERPRINT Method
No
1770
Obscure desired
Yes
1772
Call OBSCURE Method
No
1774
Commit secure database transaction
1776
READ Method Proces Completed

WRITE Method Use Process Flow

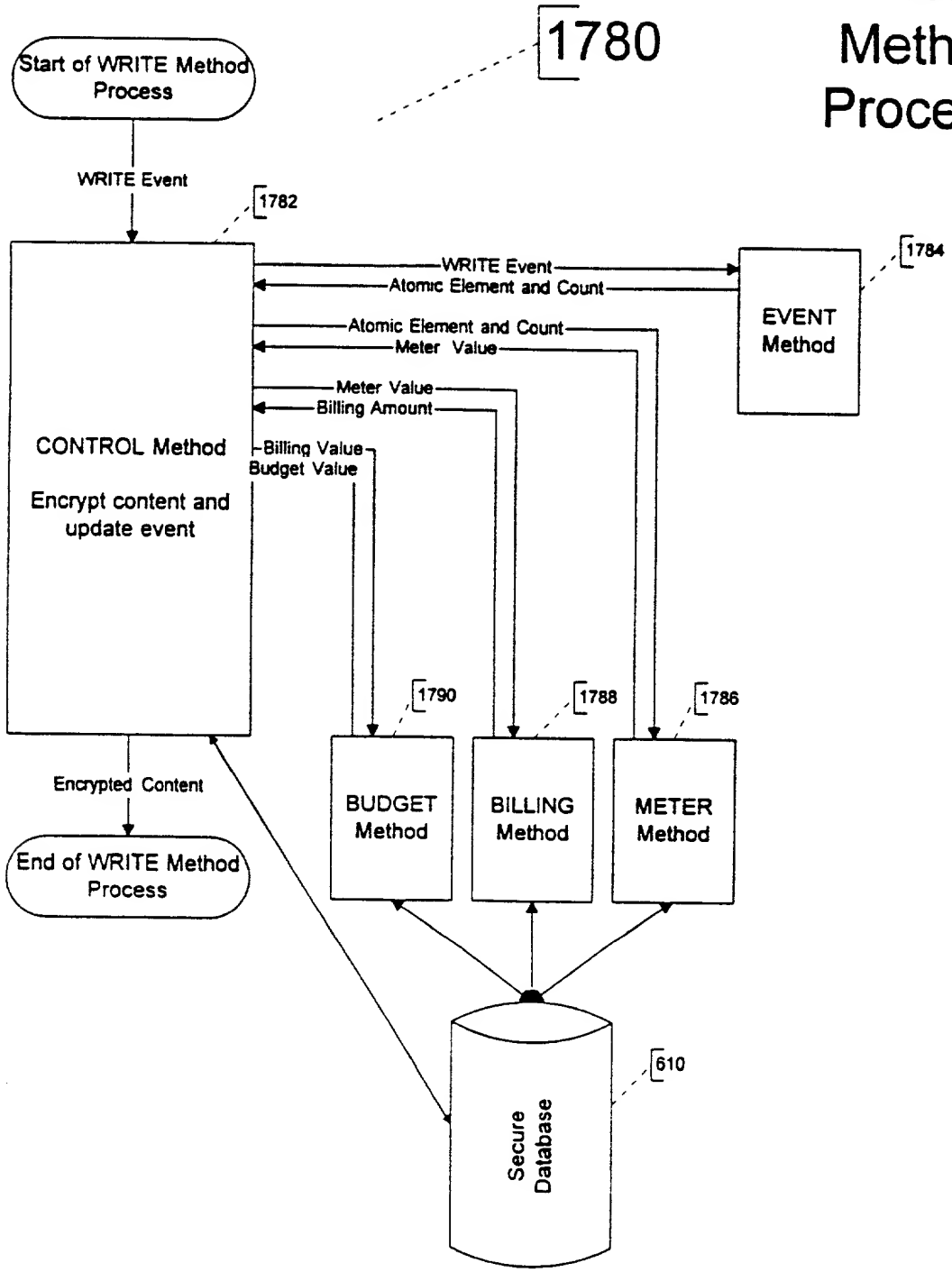


Figure 51

1780

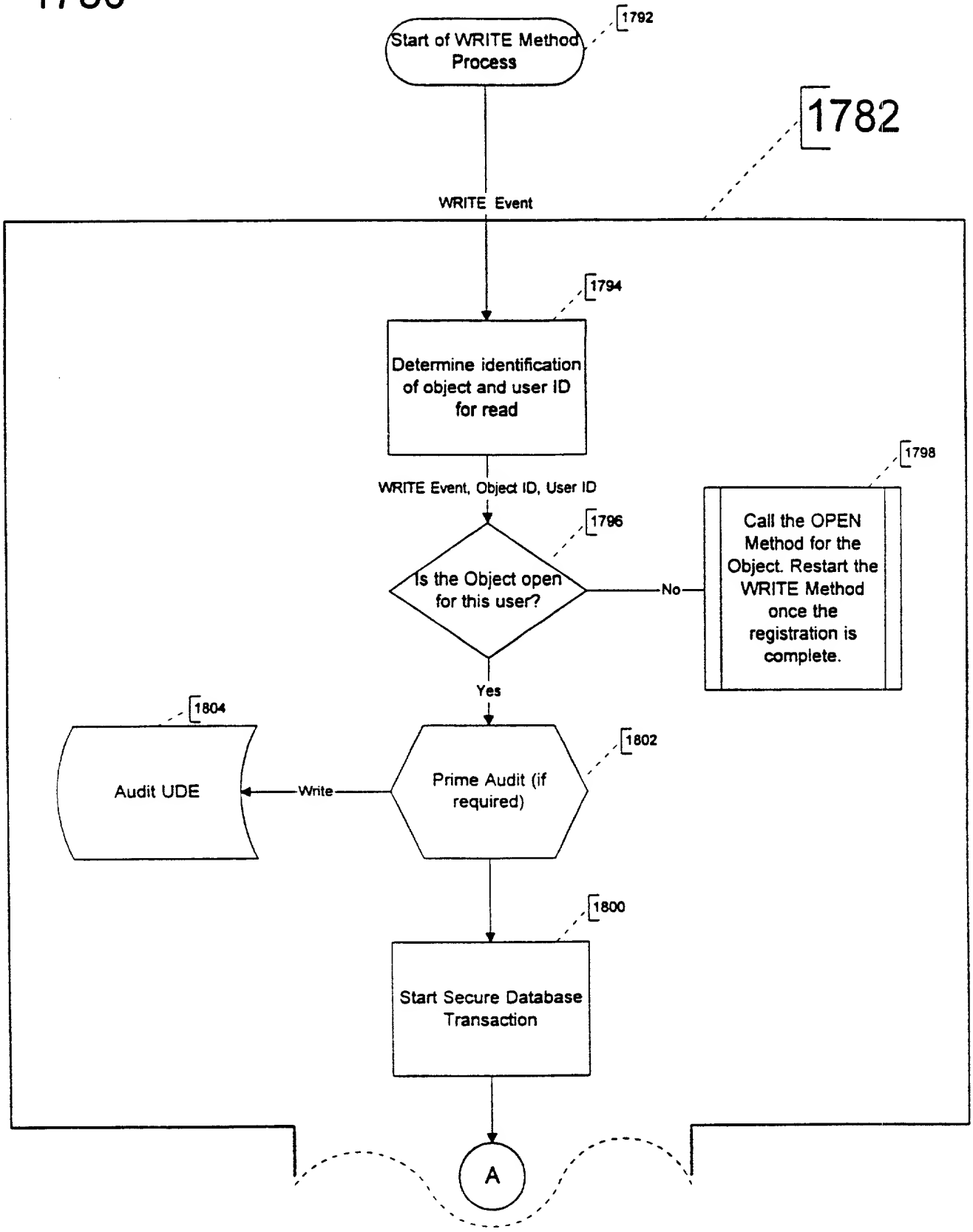


Figure 51a

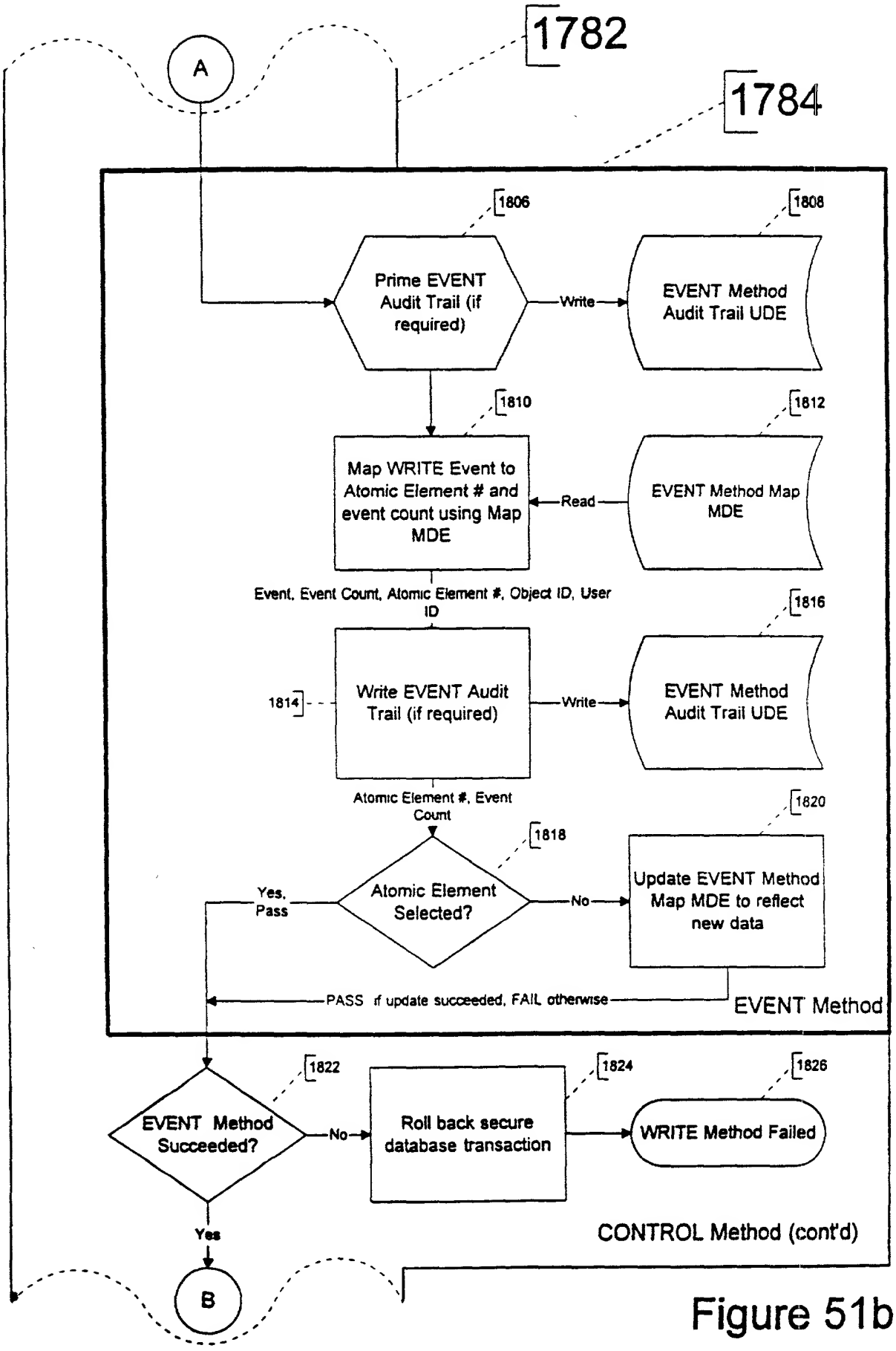

1782
1784
A
1806
1808
Prime EVENT Audit Trail (if required)
Write
EVENT Method Audit Trail UDE
1810
1812
Map WRITE Event to Atomic Element # and event count using Map MDE
Read
EVENT Method Map MDE
Event, Event Count, Atomic Element #, Object ID, User ID
1816
1814
Write EVENT Audit Trail (if required)
Write
EVENT Method Audit Trail UDE
Atomic Element #, Event Count
1820
1818
Yes, Pass
Atomic Element Selected?
No
Update EVENT Method Map MDE to reflect new data
PASS if update succeeded, FAIL otherwise
EVENT Method
1822
1824
1826
EVENT Method Succeeded?
No
Roll back secure database transaction
WRITE Method Failed
Yes
CONTROL Method (cont'd)
B

Figure 51b

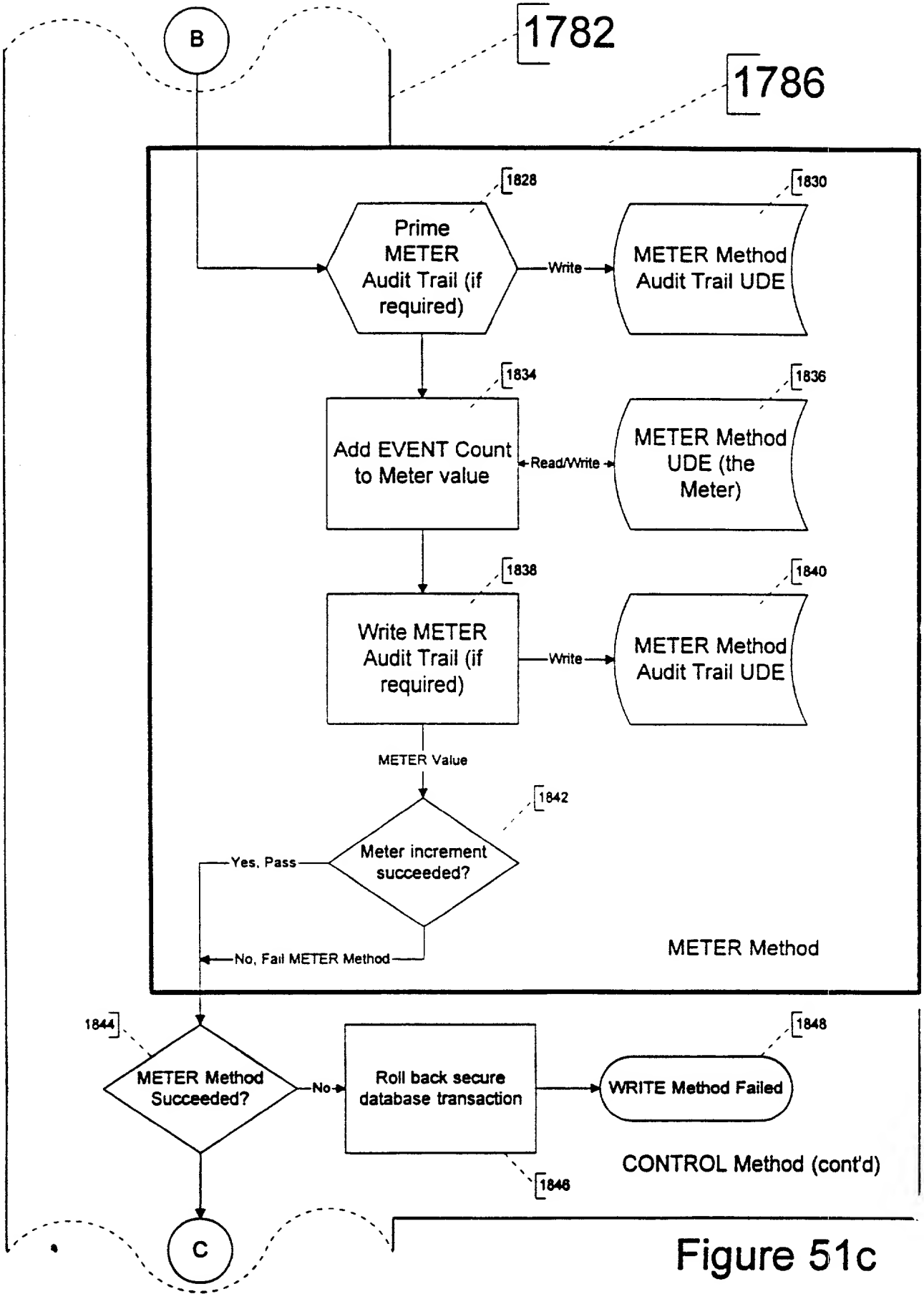

B
1782
1786
1828
Prime METER Audit Trail (if required)
Write
1830
METER Method Audit Trail UDE
1834
Add EVENT Count to Meter value
Read/Write
1836
METER Method UDE (the Meter)
1838
Write METER Audit Trail (if required)
Write
1840
METER Method Audit Trail UDE
METER Value
1842
Meter increment succeeded?
Yes, Pass
No, Fail METER Method
METER Method
1844
METER Method Succeeded?
No
Roll back secure database transaction
1848
WRITE Method Failed
1846
CONTROL Method (cont'd)
C

Figure 51c

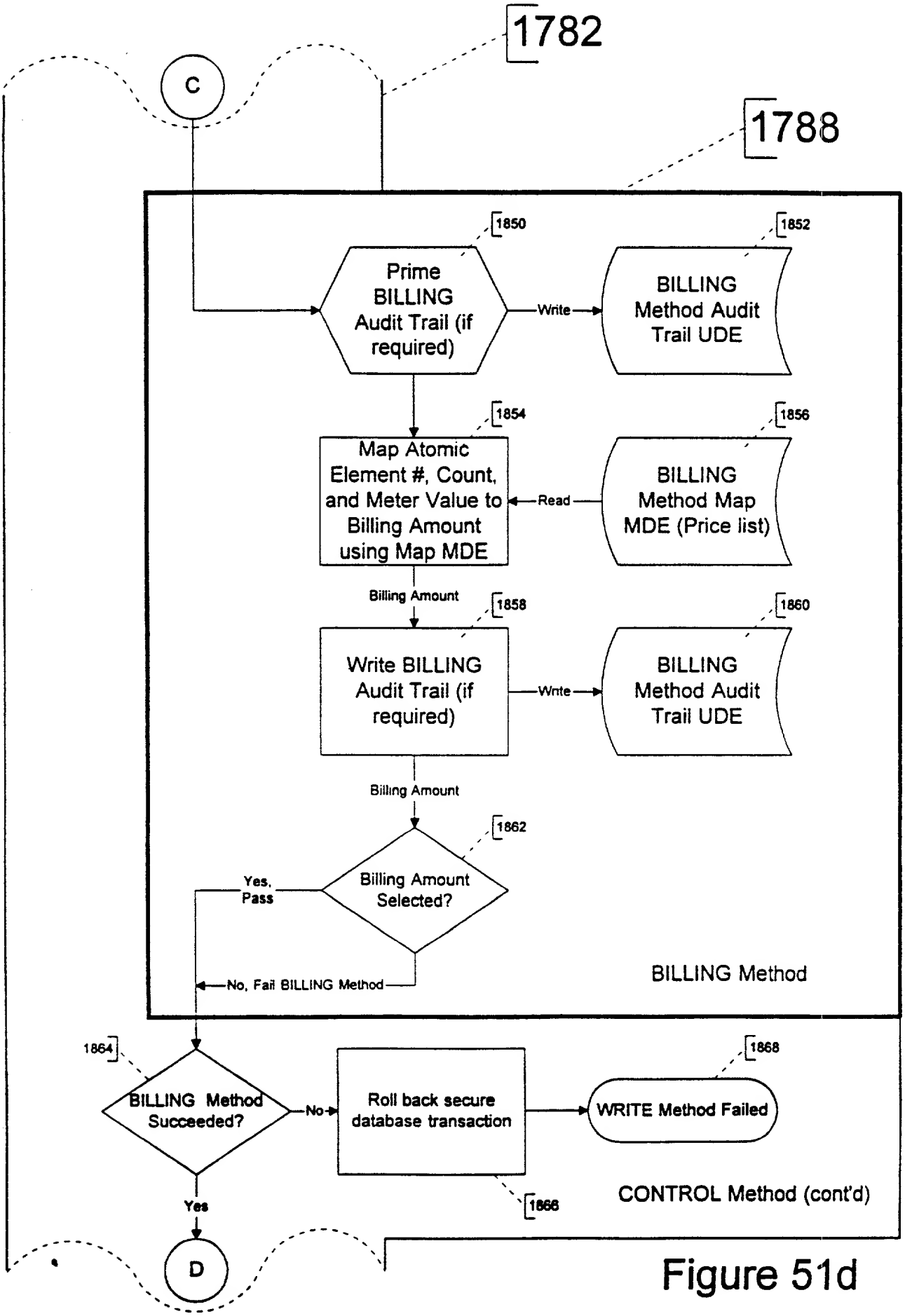

1782
C
1788
1850
Prime BILLING Audit Trail (if required)
Write
1852
BILLING Method Audit Trail UDE
1854
Map Atomic Element #, Count, and Meter Value to Billing Amount using Map MDE
Read
1856
BILLING Method Map MDE (Price list)
Billing Amount
1858
Write BILLING Audit Trail (if required)
Write
1860
BILLING Method Audit Trail UDE
Billing Amount
1862
Billing Amount Selected?
Yes, Pass
No, Fail BILLING Method
BILLING Method
1864
BILLING Method Succeeded?
No
Roll back secure database transaction
1868
WRITE Method Failed
1866
Yes
CONTROL Method (cont'd)
D

Figure 51d

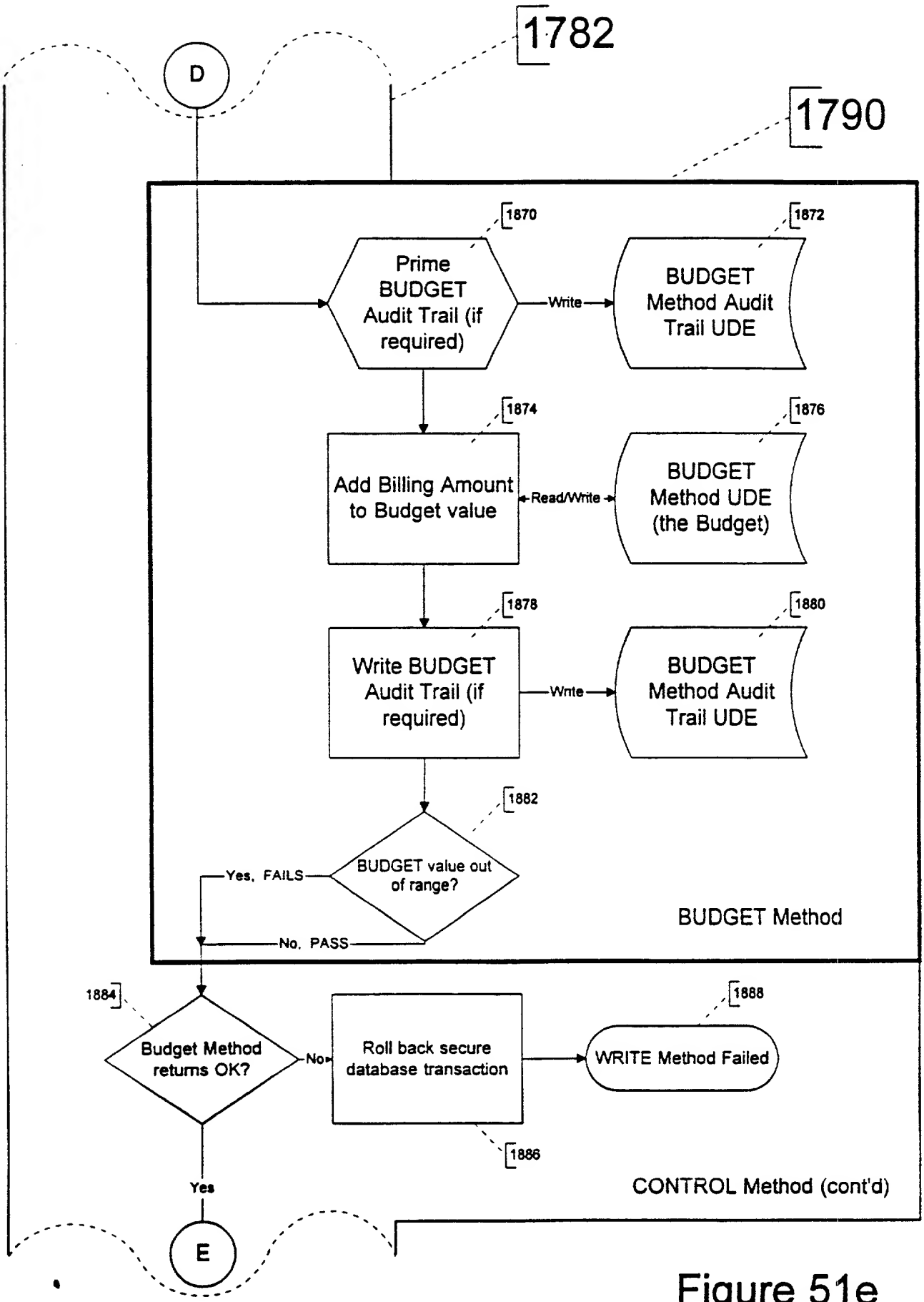
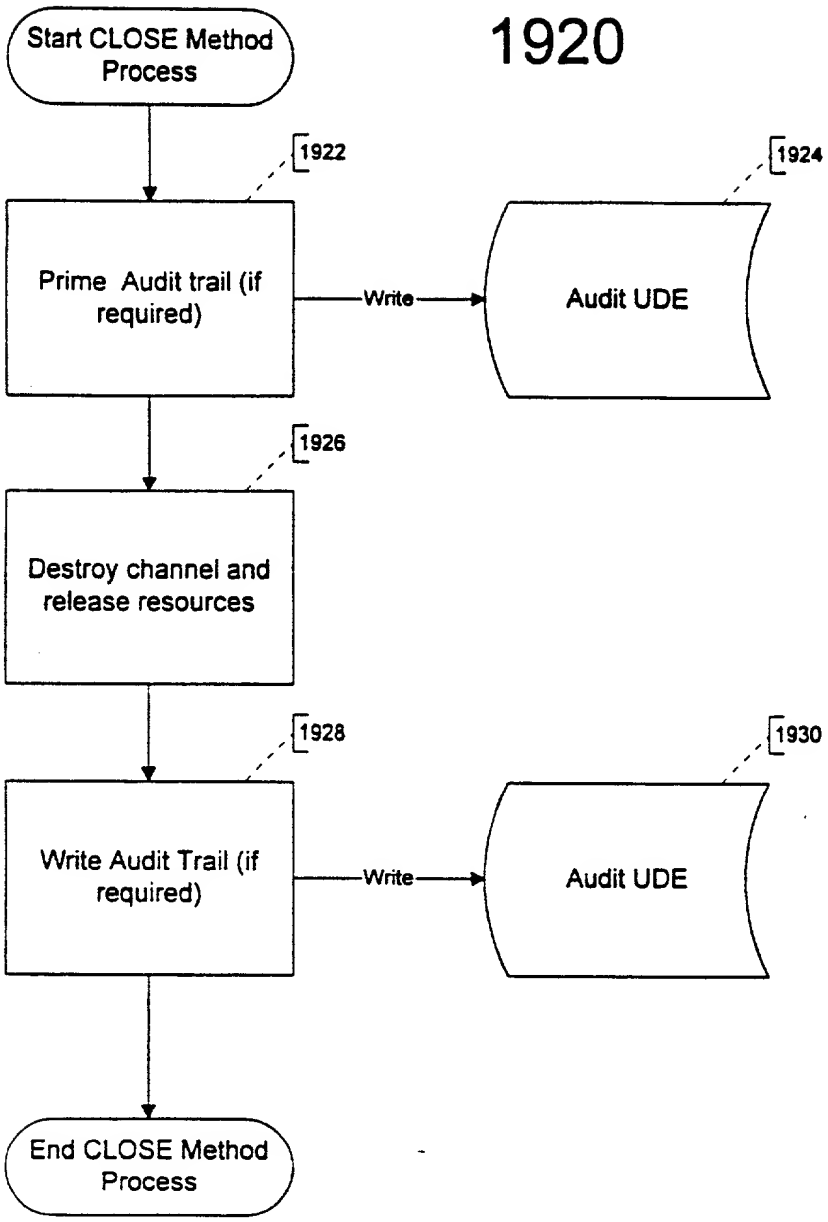

1782
1790
D
1870
Prime BUDGET Audit Trail (if required)
Write
1872
BUDGET Method Audit Trail UDE
1874
Add Billing Amount to Budget value
Read/Write
1876
BUDGET Method UDE (the Budget)
1878
Write BUDGET Audit Trail (if required)
Write
1880
BUDGET Method Audit Trail UDE
1882
BUDGET value out of range?
Yes, FAILS
No, PASS
BUDGET Method
1884
Budget Method returns OK?
No
Roll back secure database transaction
1888
WRITE Method Failed
1886
Yes
CONTROL Method (cont'd)
E

Figure 51e



CLOSE Method Process Flow

Figure 52

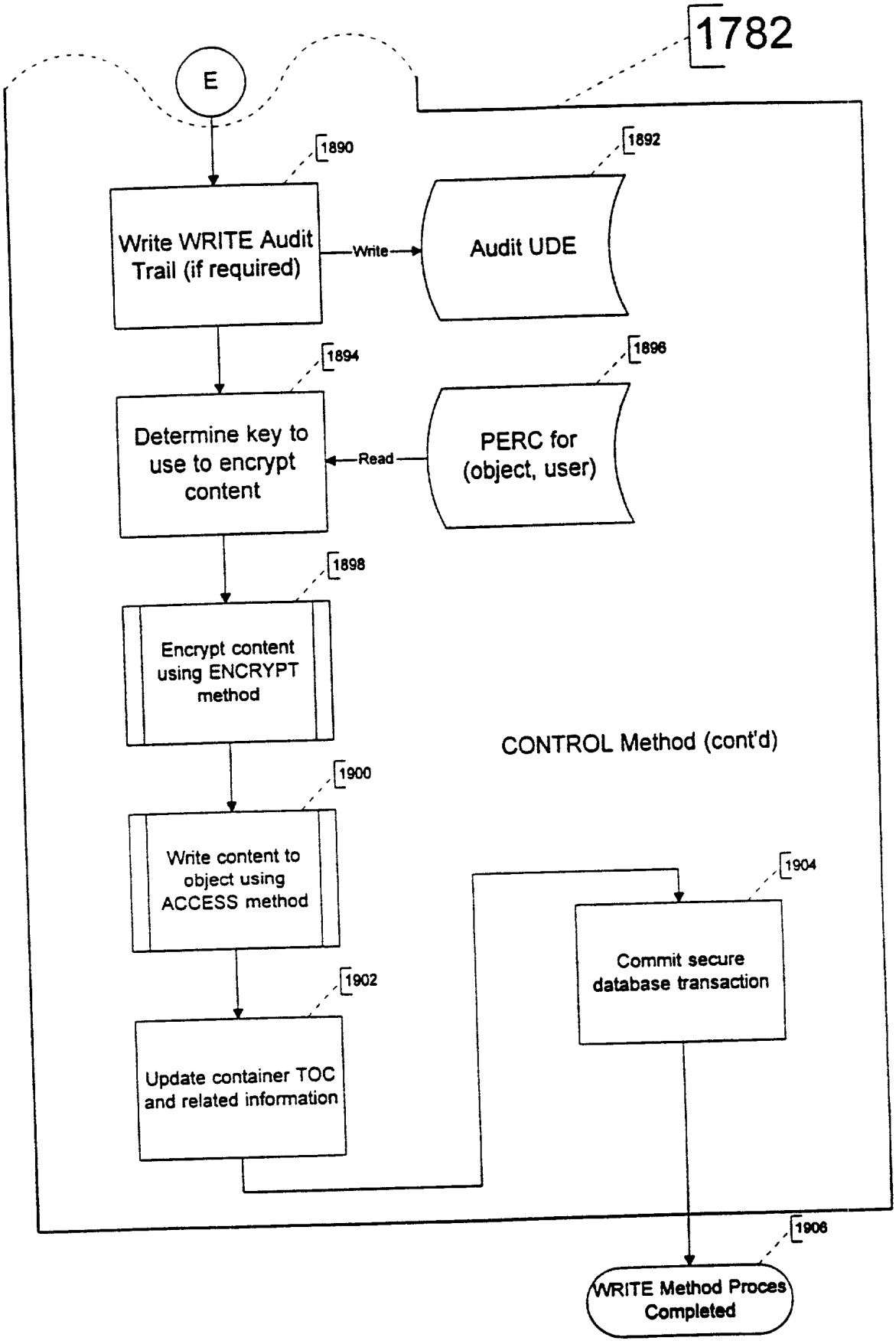

1782
E
1890
Write WRITE Audit Trail (if required)
Write
1892
Audit UDE
1894
Determine key to use to encrypt content
Read
1896
PERC for (object, user)
1898
Encrypt content using ENCRYPT method
CONTROL Method (cont'd)
1900
Write content to object using ACCESS method
1902
Update container TOC and related information
1904
Commit secure database transaction
1906
WRITE Method Proces Completed

Figure 51f

Sample EVENT Method Mapping Process

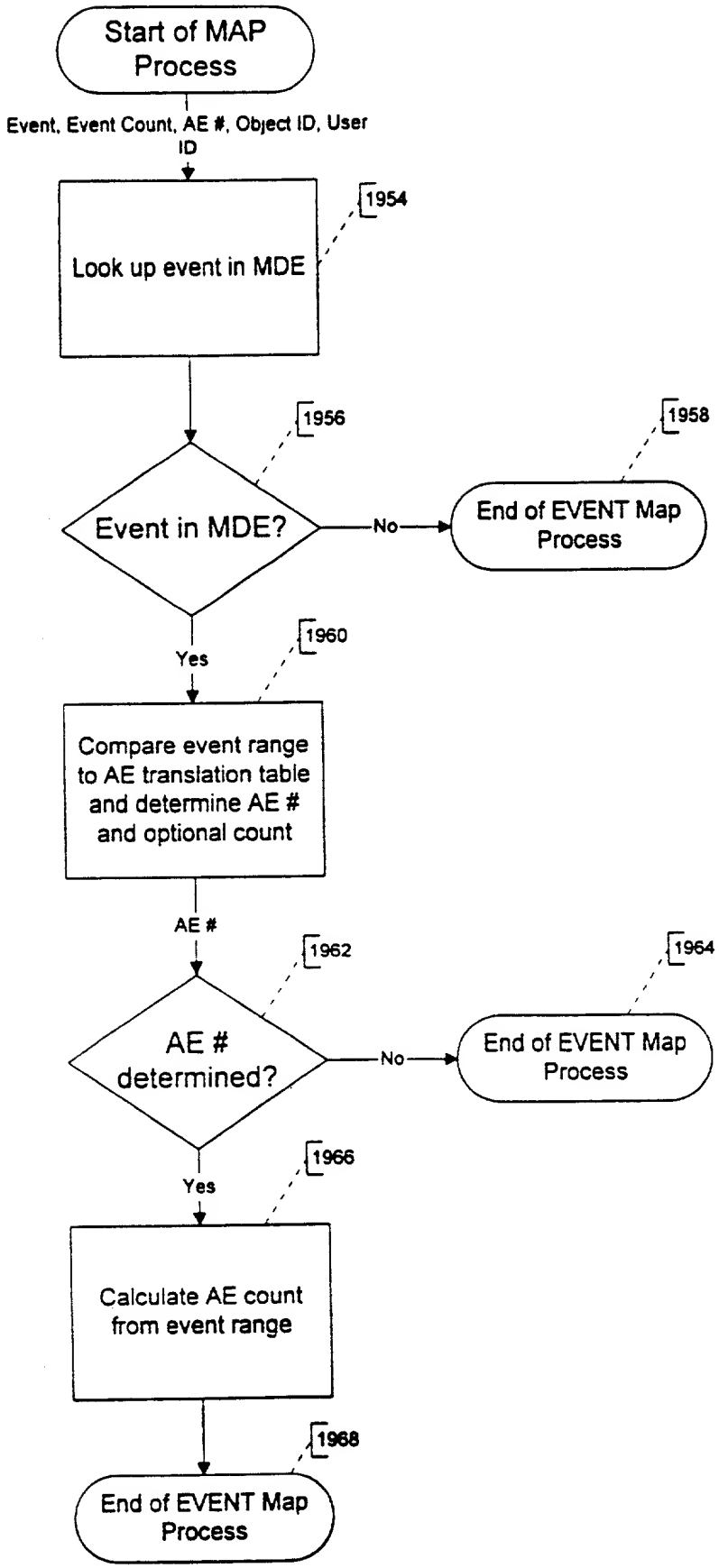
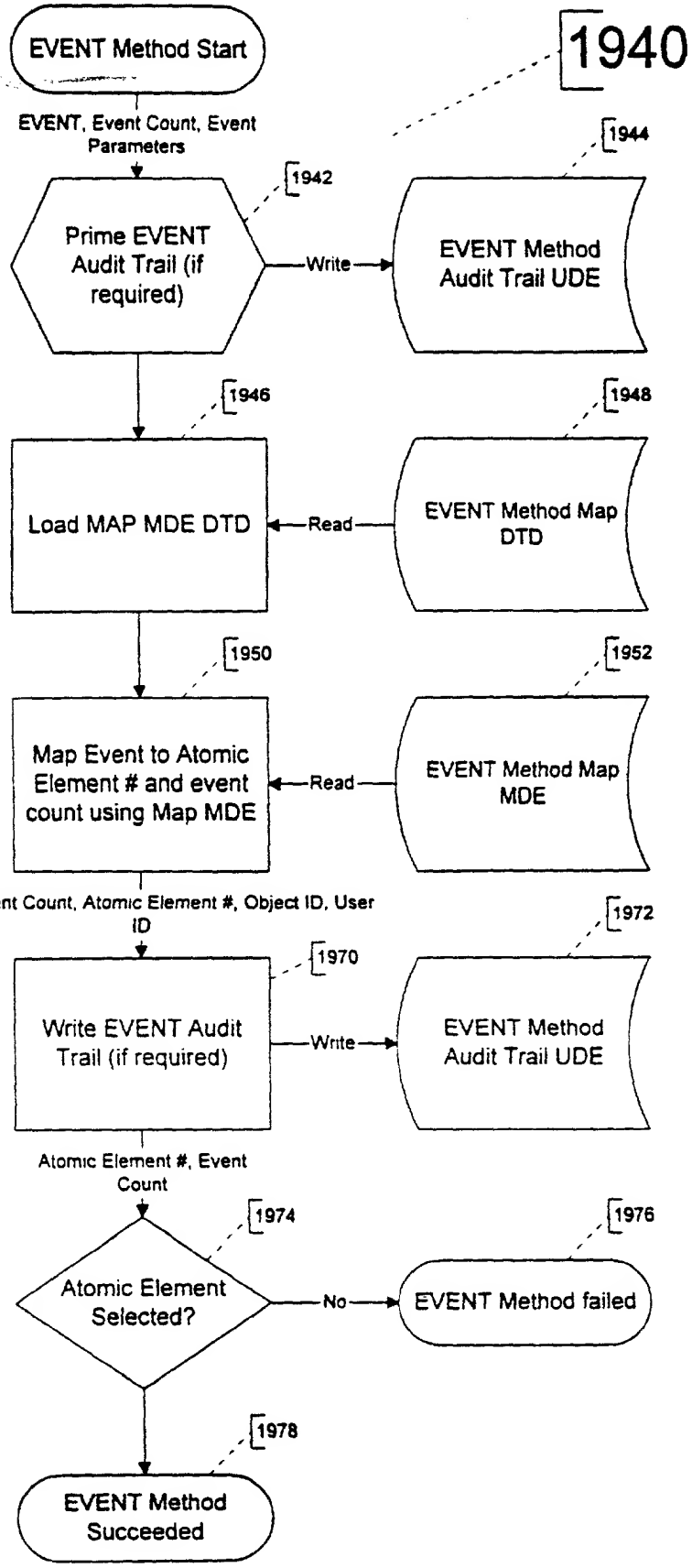


Figure 53b



EVENT Method Process Flows

Figure 53a

ACCESS Method Process Flow

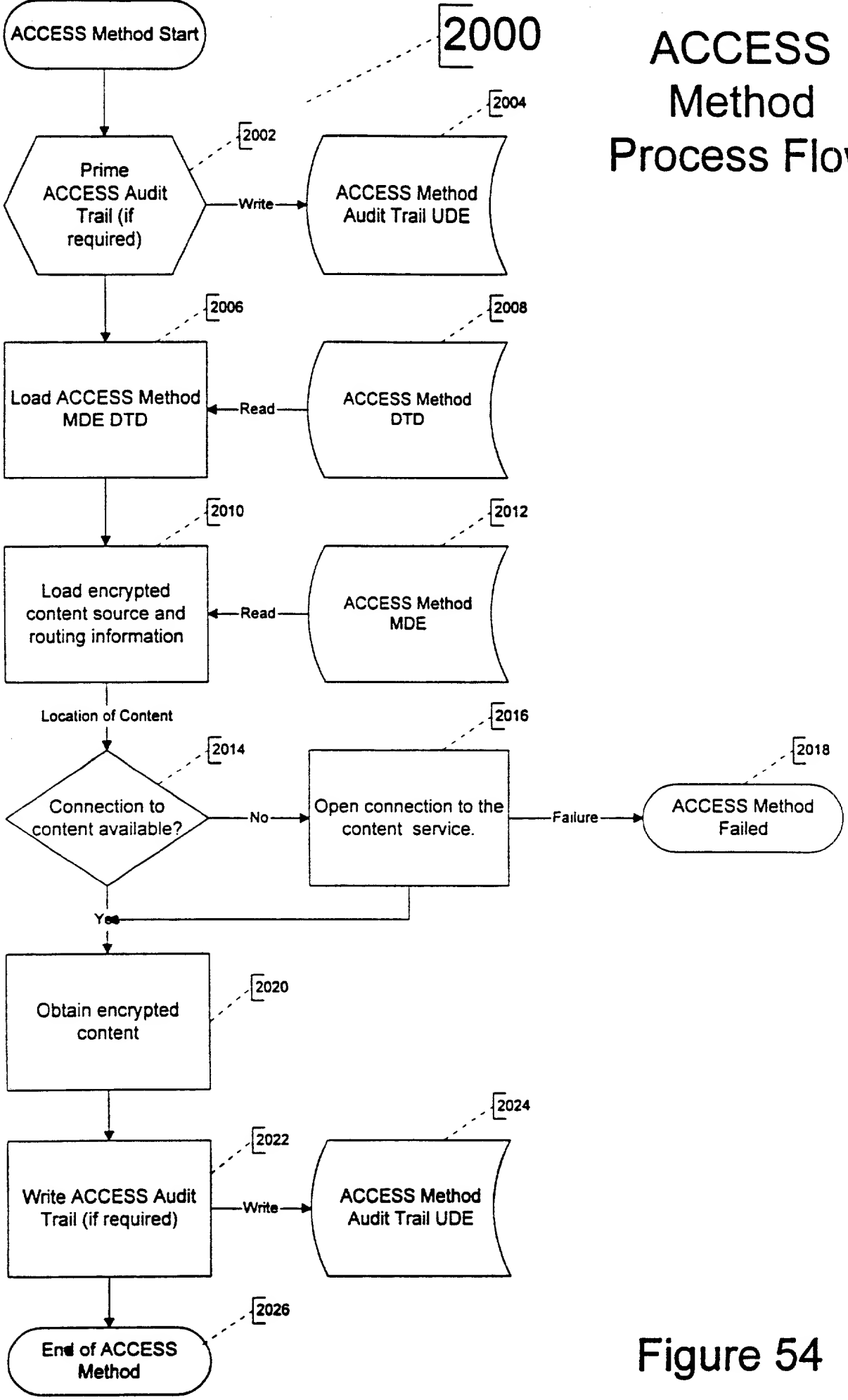


Figure 54

BILLING Method Process Flows

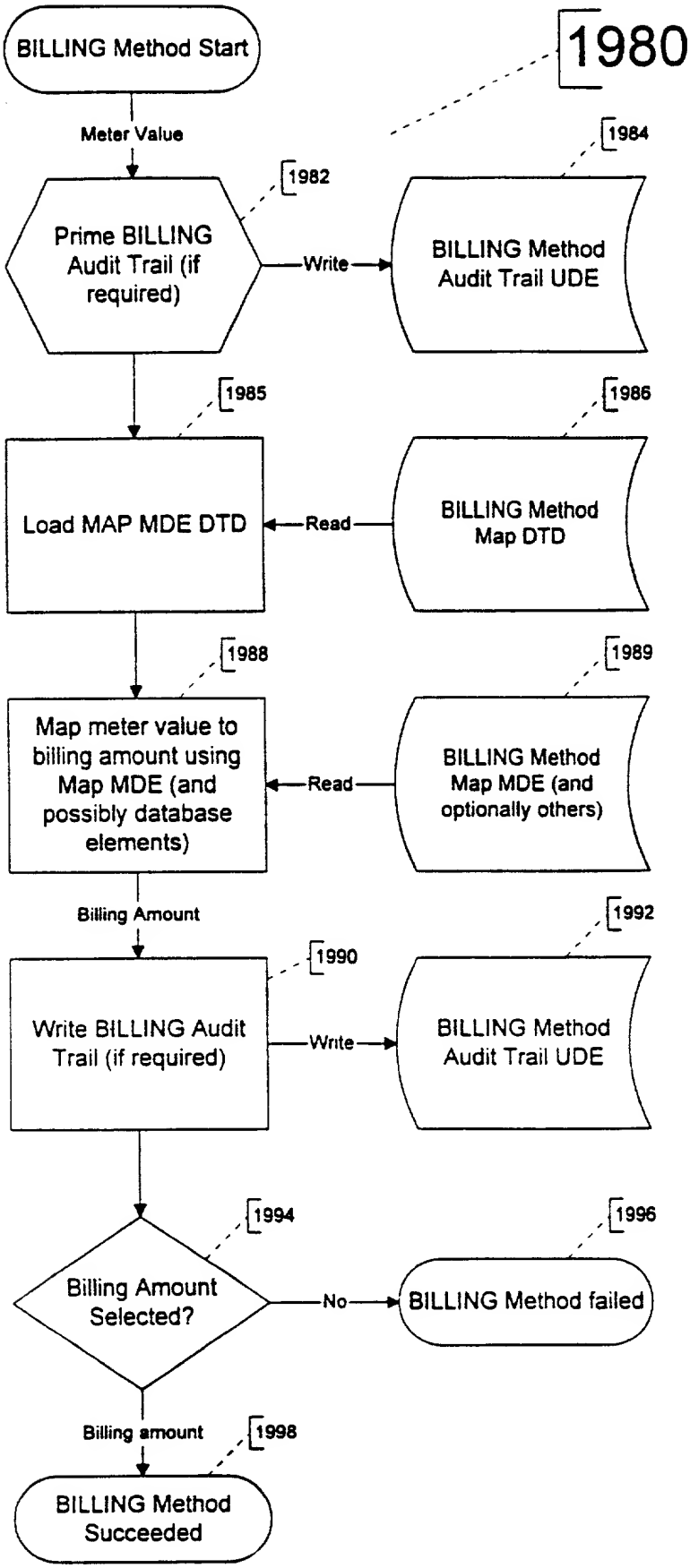


Figure 53c

ENCRYPT Method Process Flow

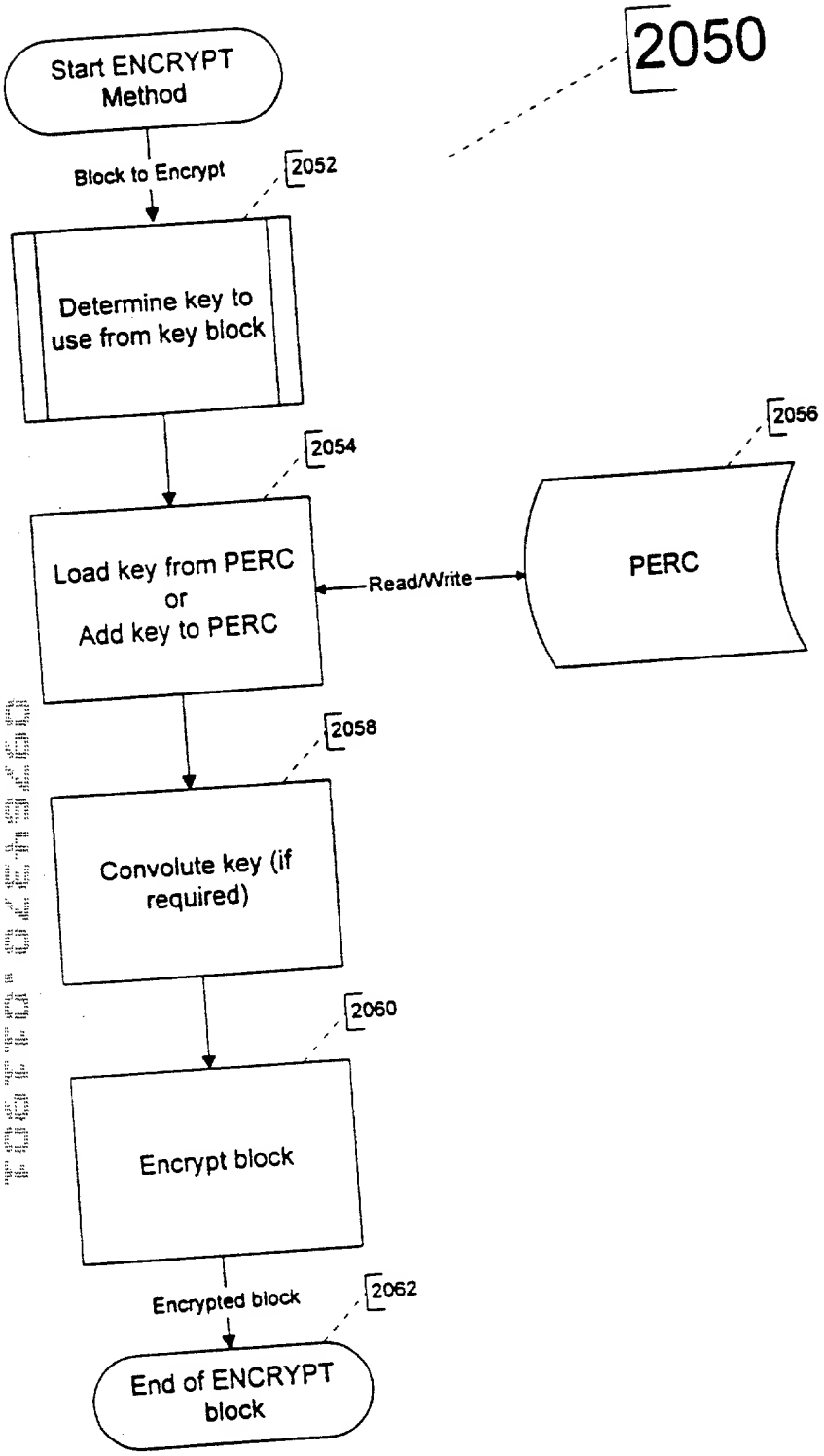


Figure 55b

DECRYPT Method Process Flow

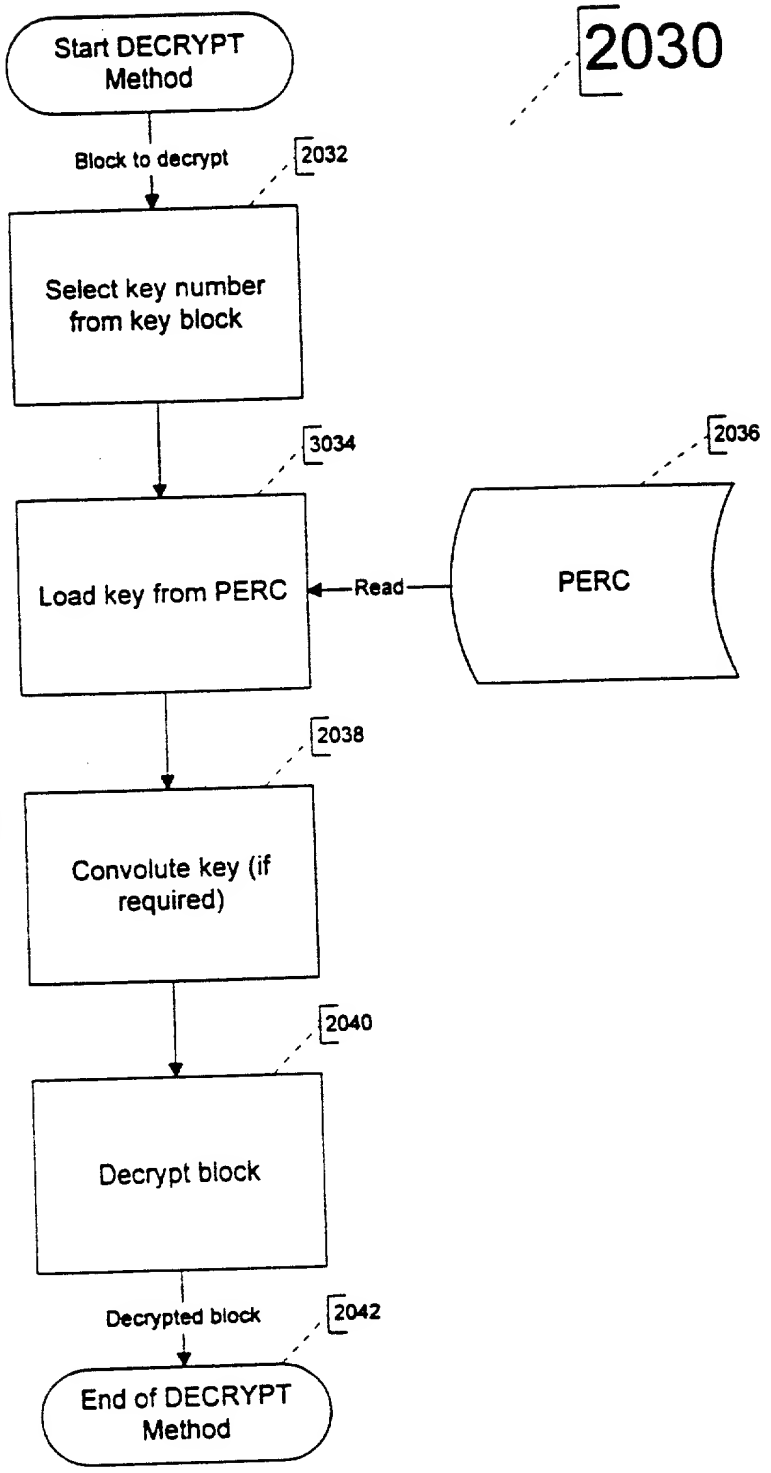


Figure 55a

EXTRACT Method Process Flow

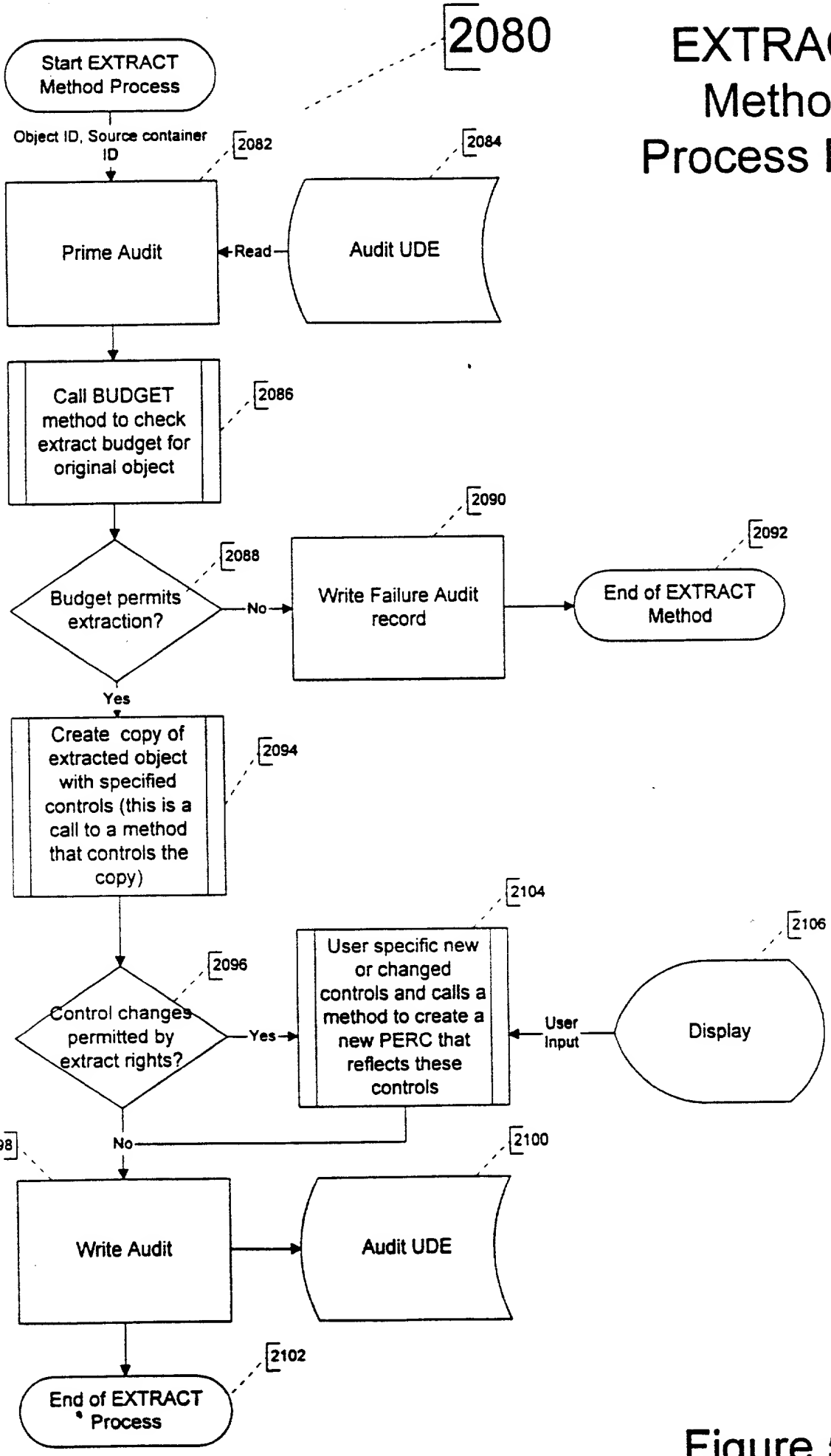


Figure 57a

CONTENT Method Process Flow

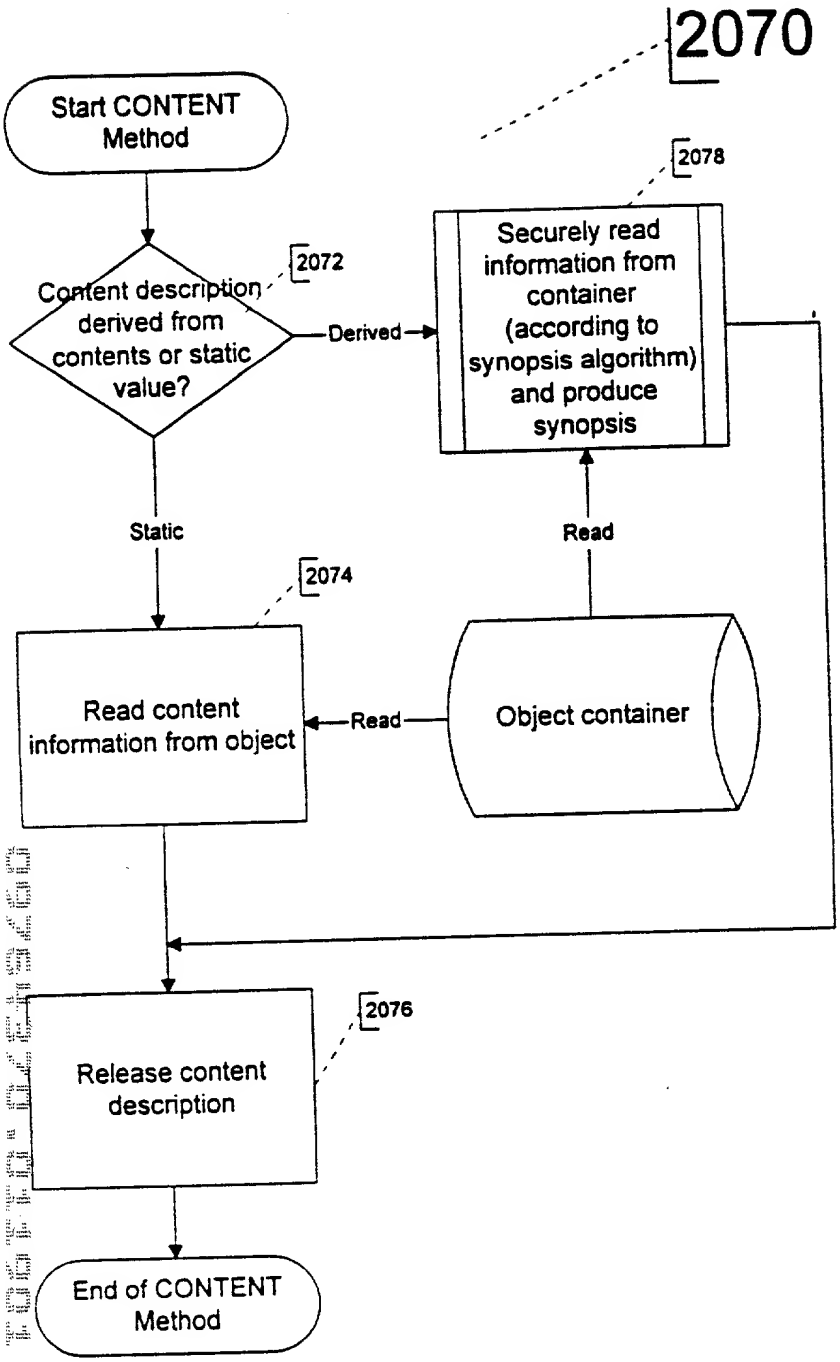
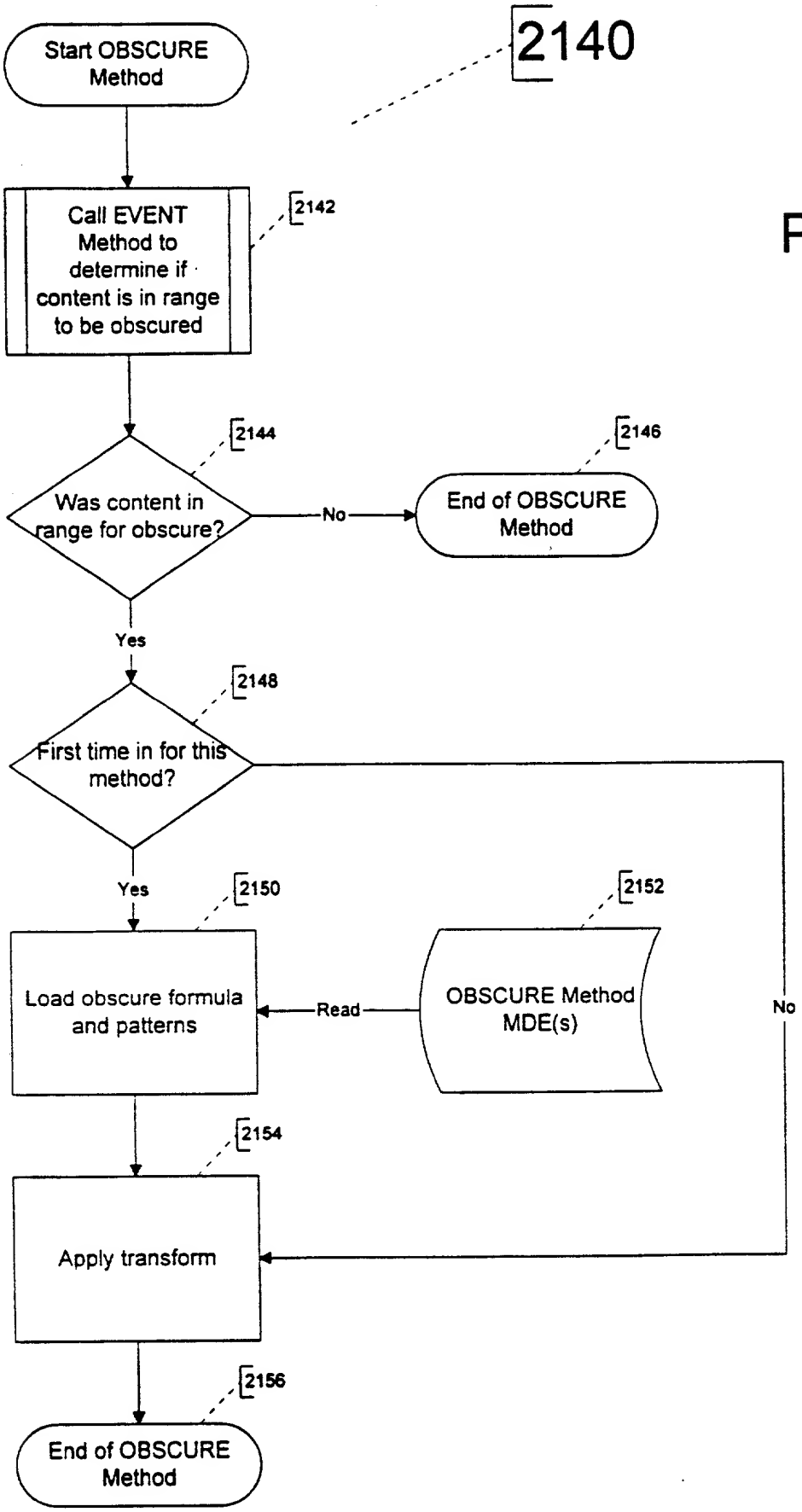


Figure 56



OBSCURE Method Process Flow

Figure 58a

EMBED Method Process Flow

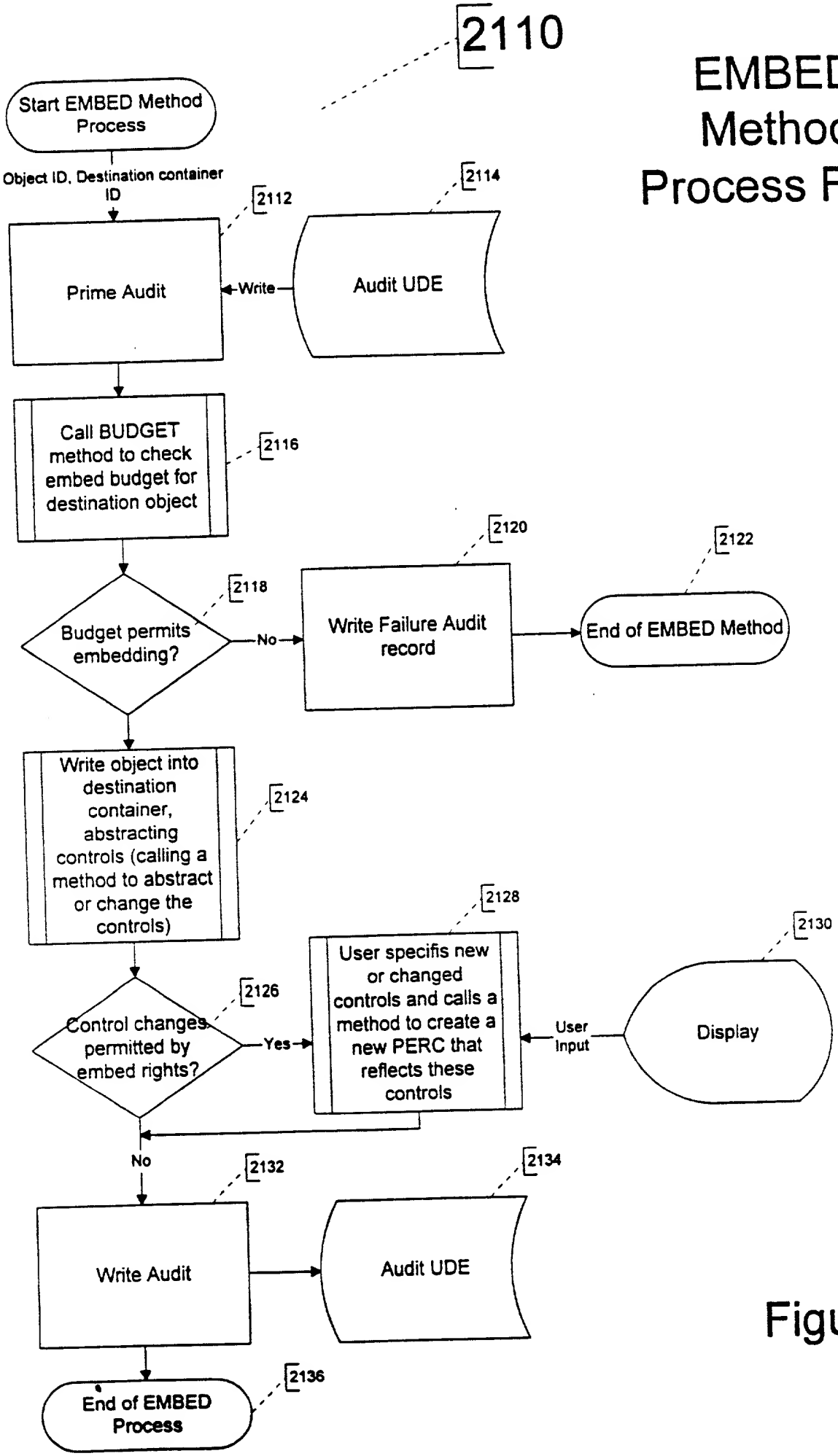


Figure 57b

Docket 62674

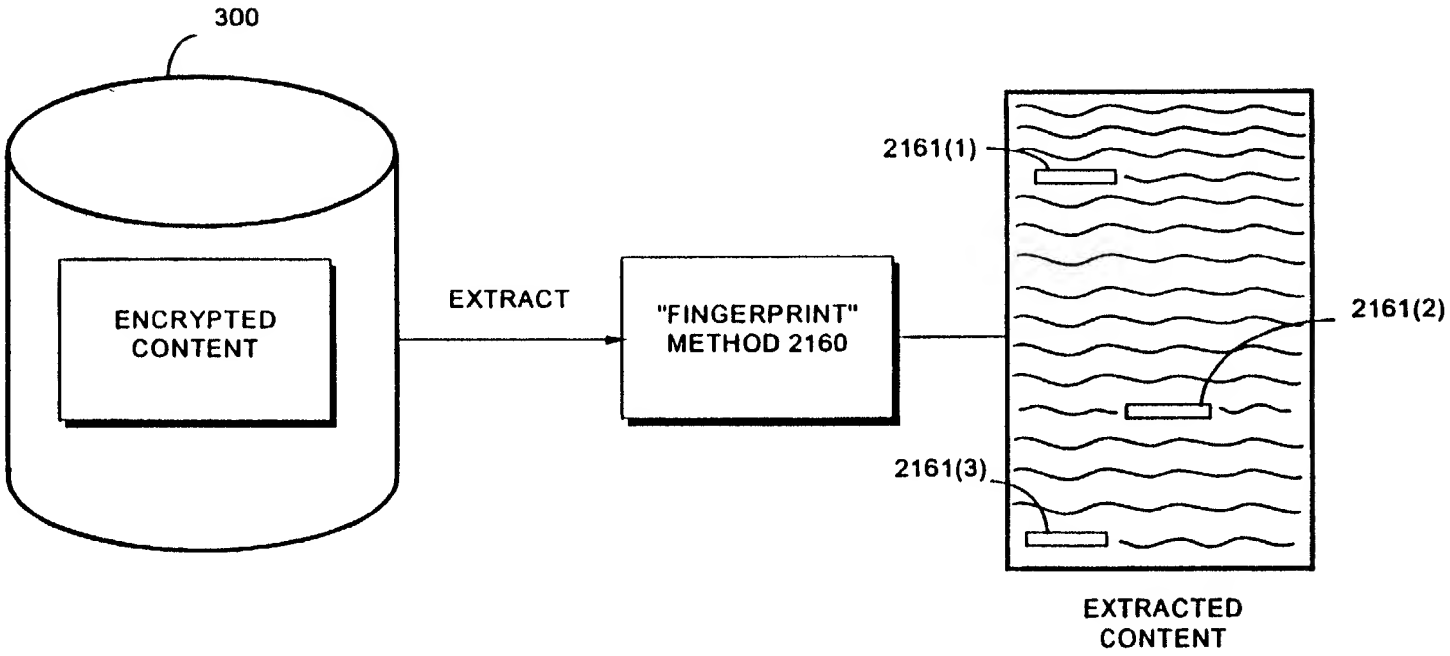


FIG. 58C

FINGERPRINT Method Process Flow

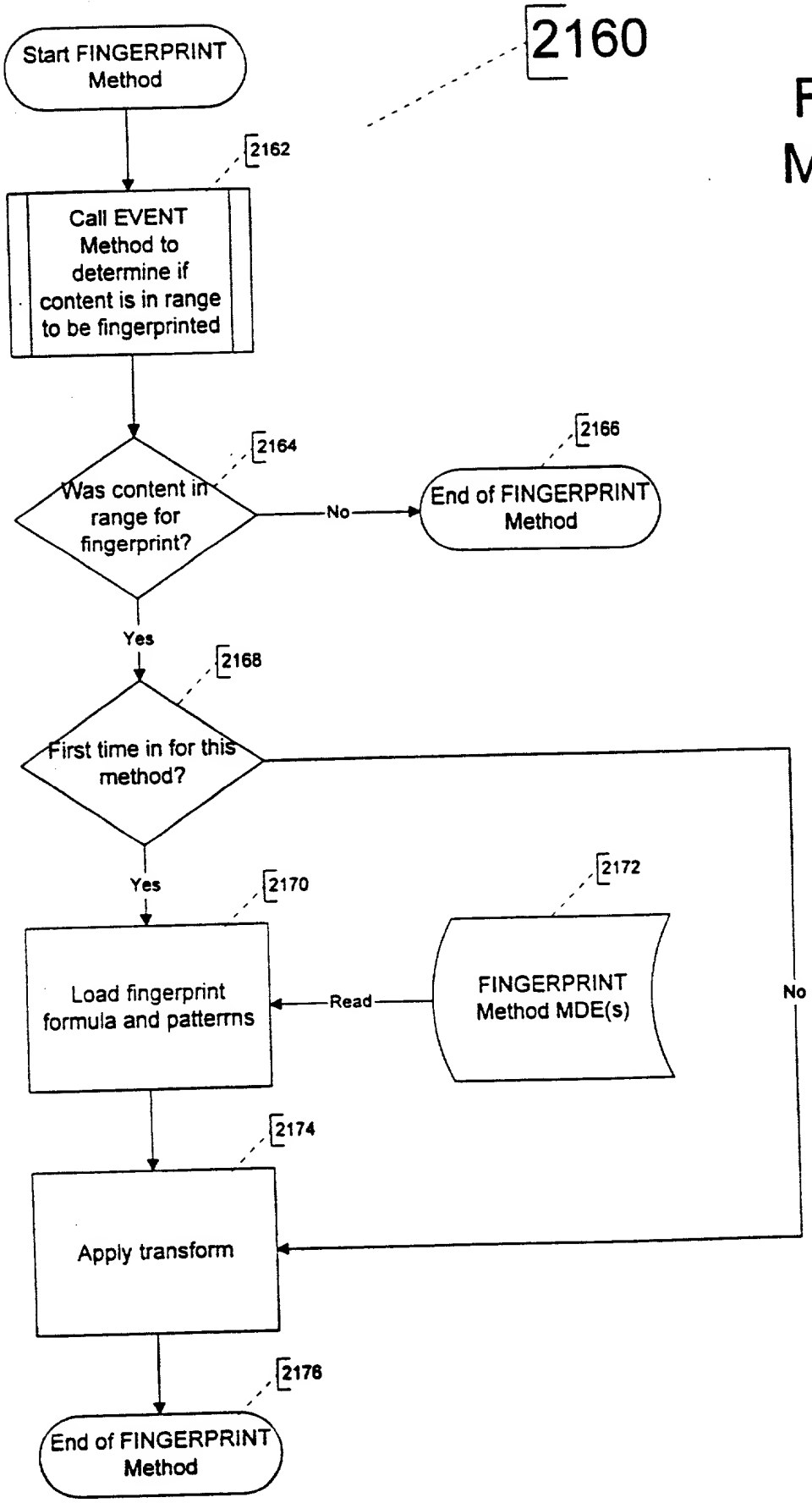
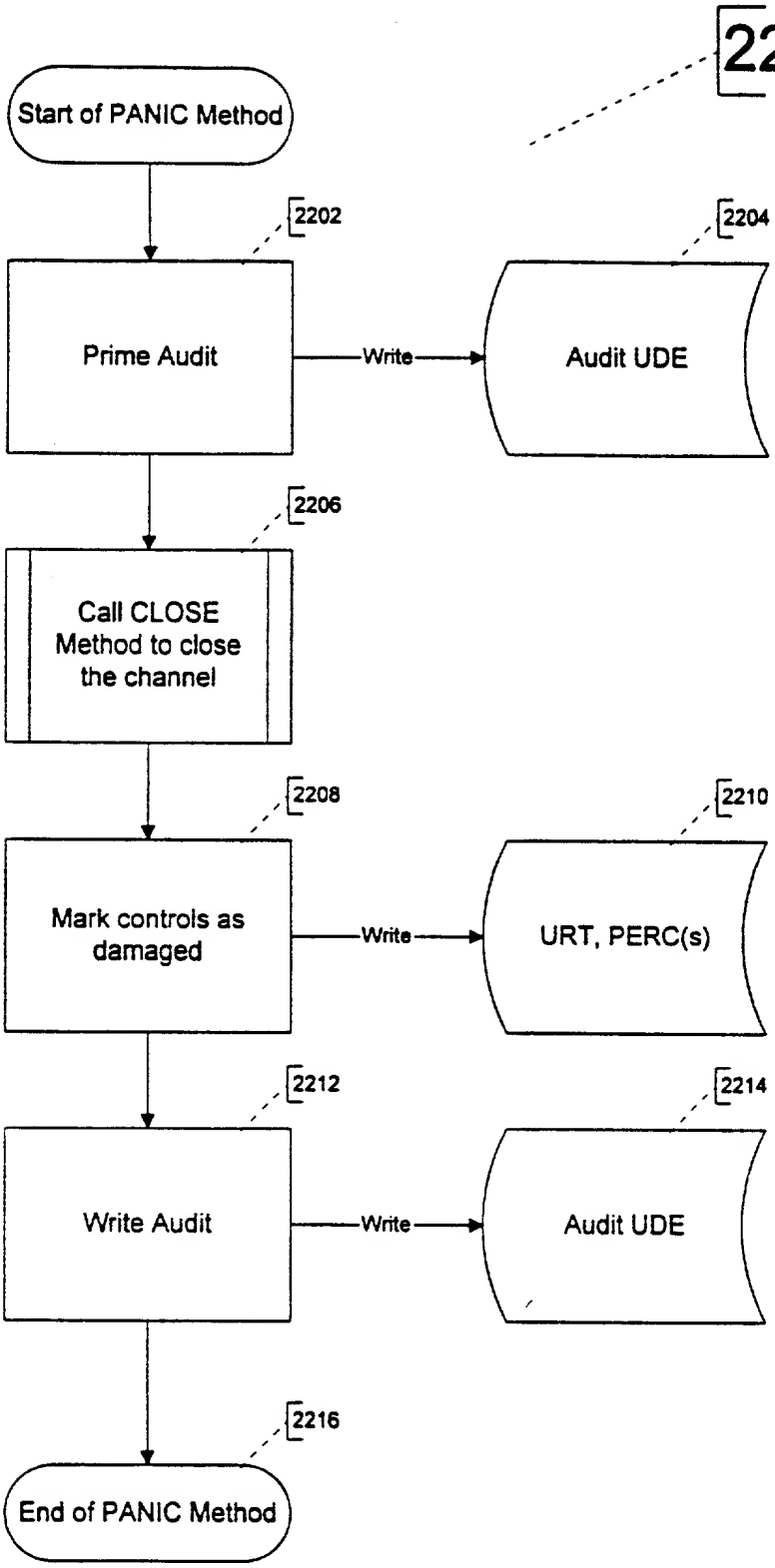


Figure 58b



PANIC Method Process Flow

Figure 60

DESTROY Method Process Flow

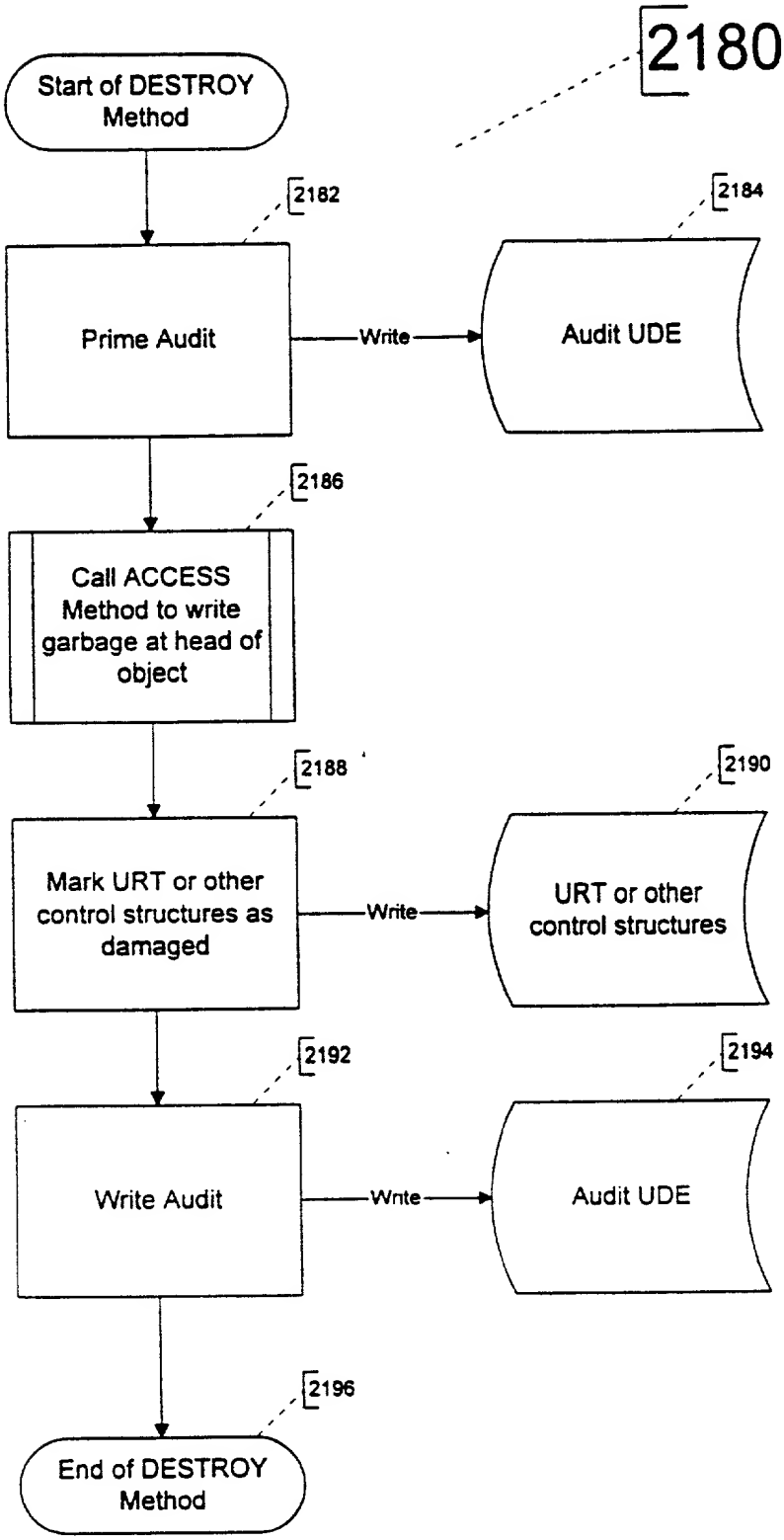
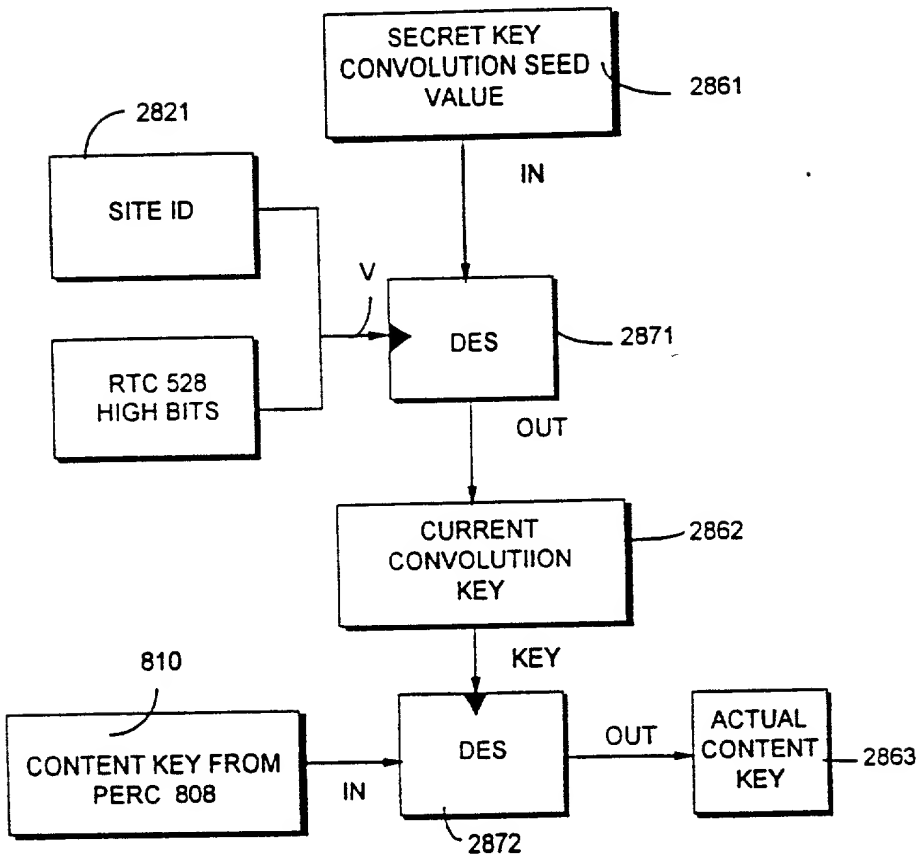


Figure 59

FIG. 62

KEY CONVOLUTION PROCESS



METER Method Use Process Flow

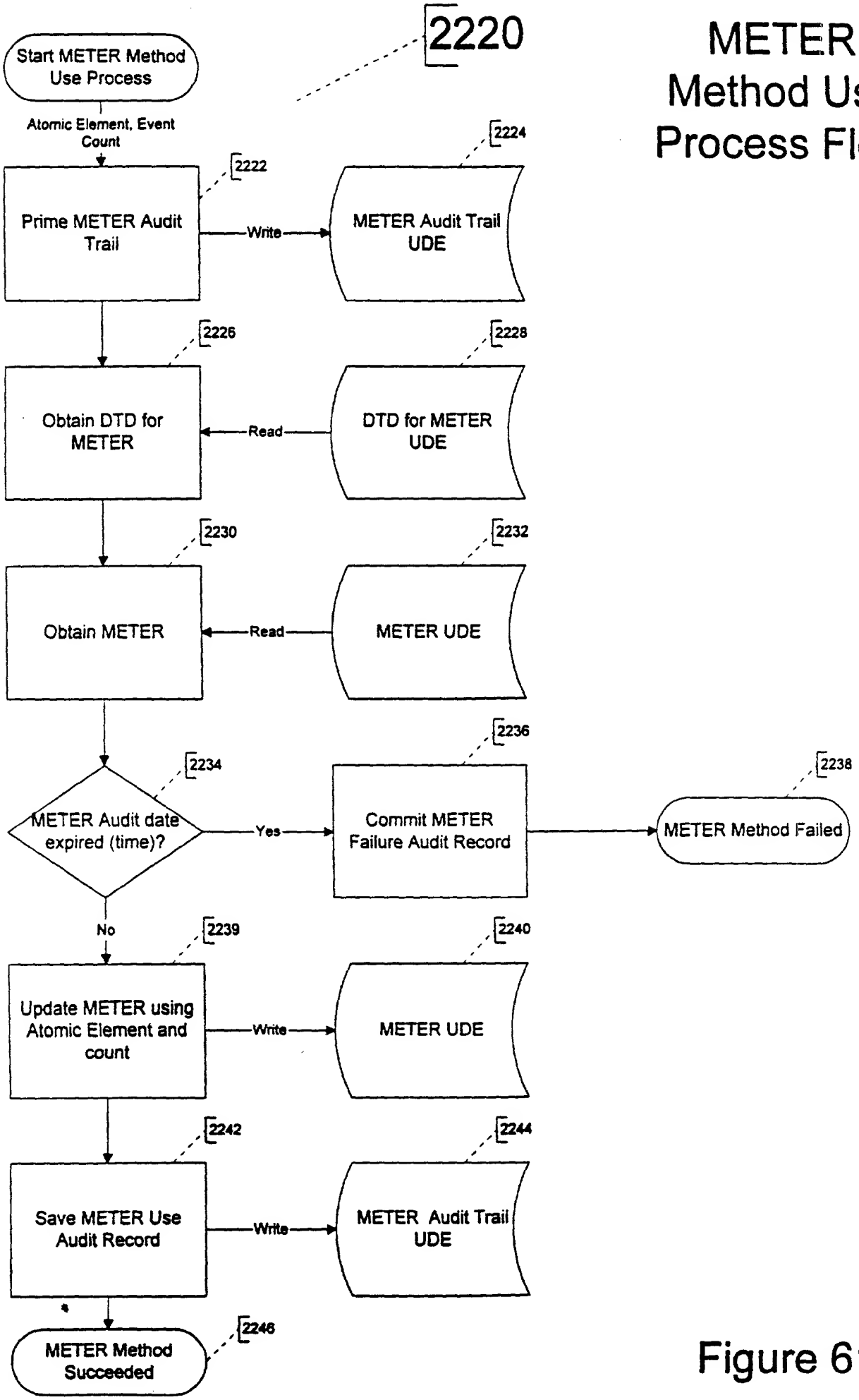
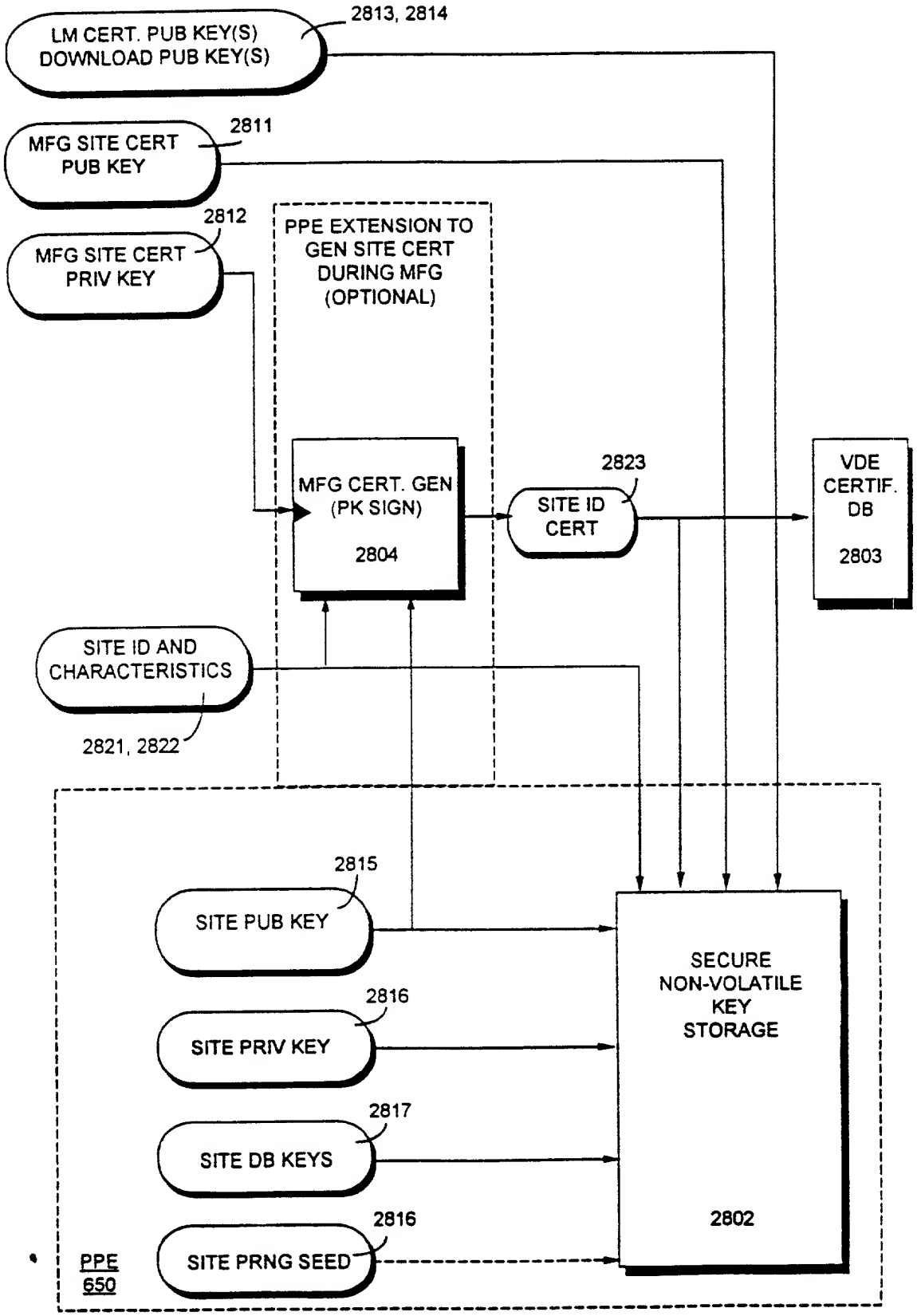


Figure 61

FIG. 64 SPU KEY INITIALIZATION/INSTALLATION



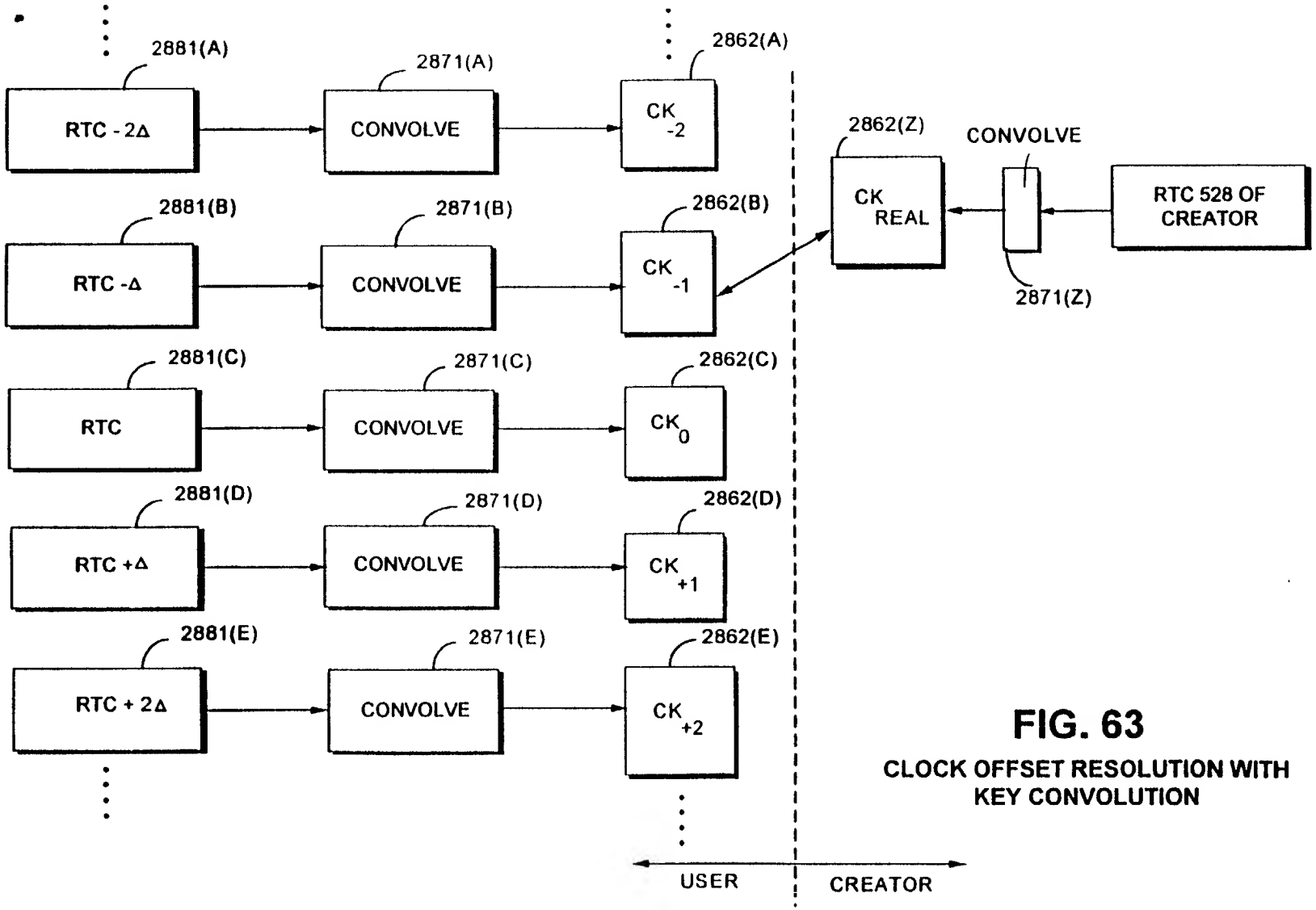


FIG. 63

CLOCK OFFSET RESOLUTION WITH KEY CONVOLUTION

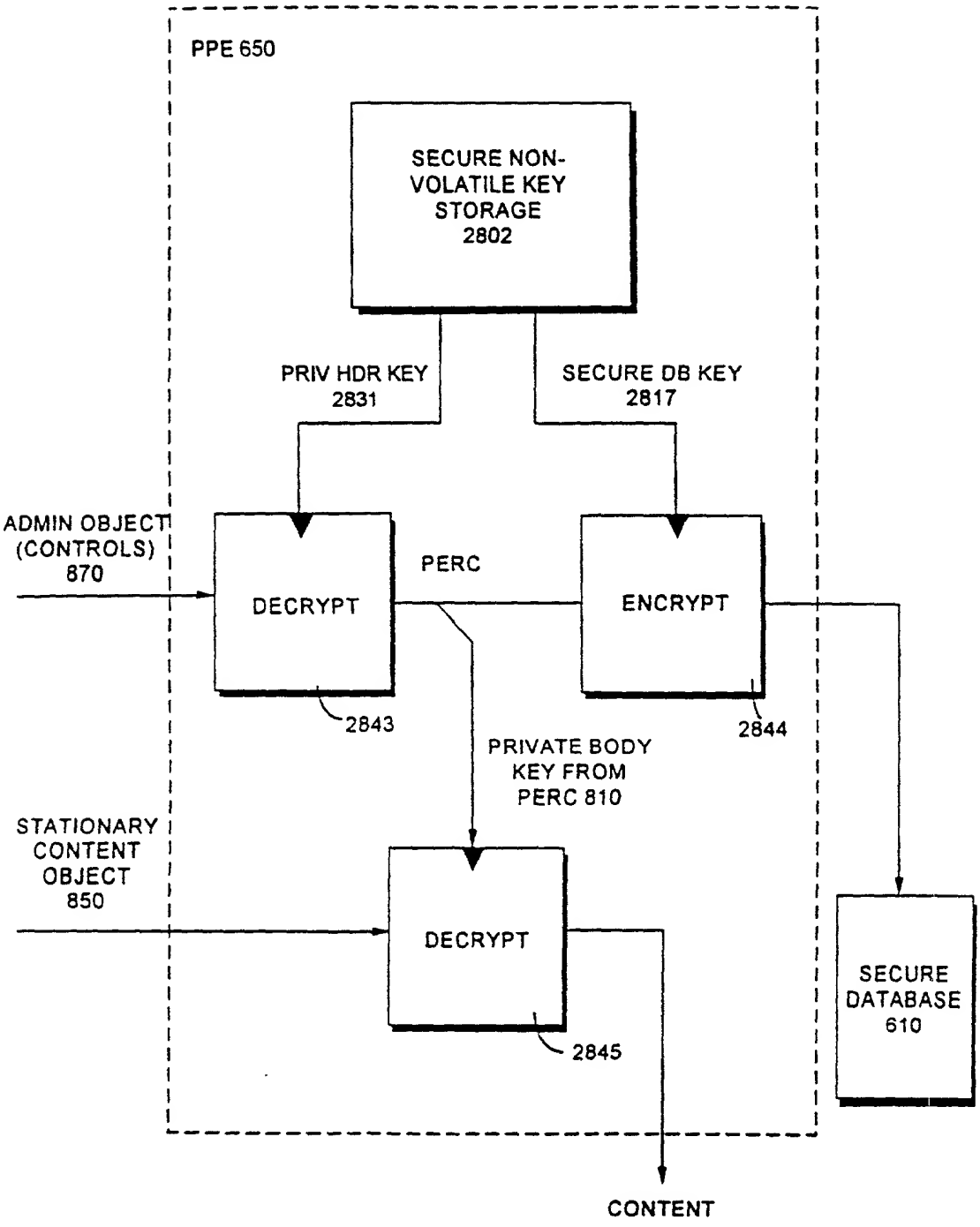
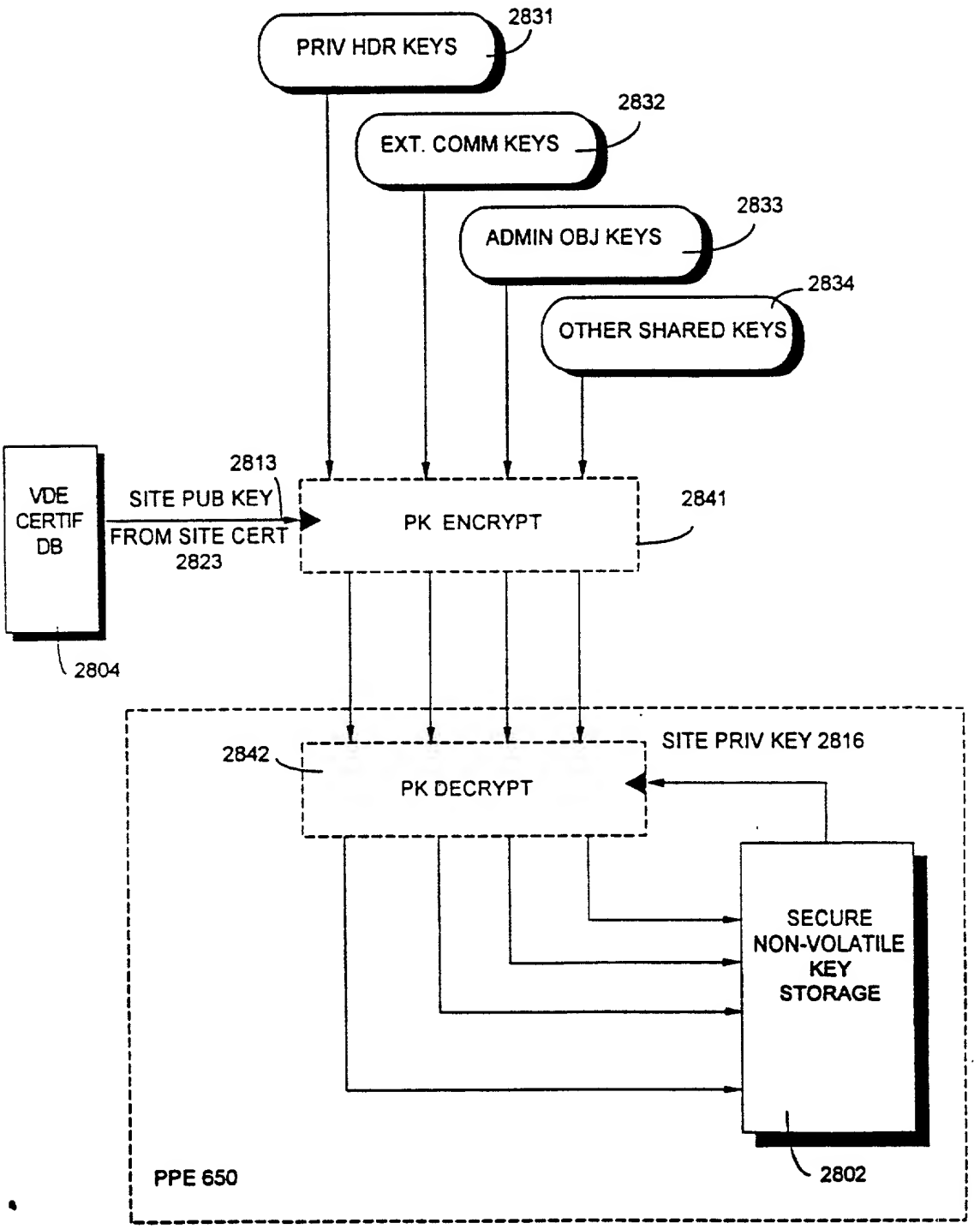


FIG. 66 STATIONARY OBJECT DECRYPTION

FIG. 65 KEY INSTALLATION & UPDATE



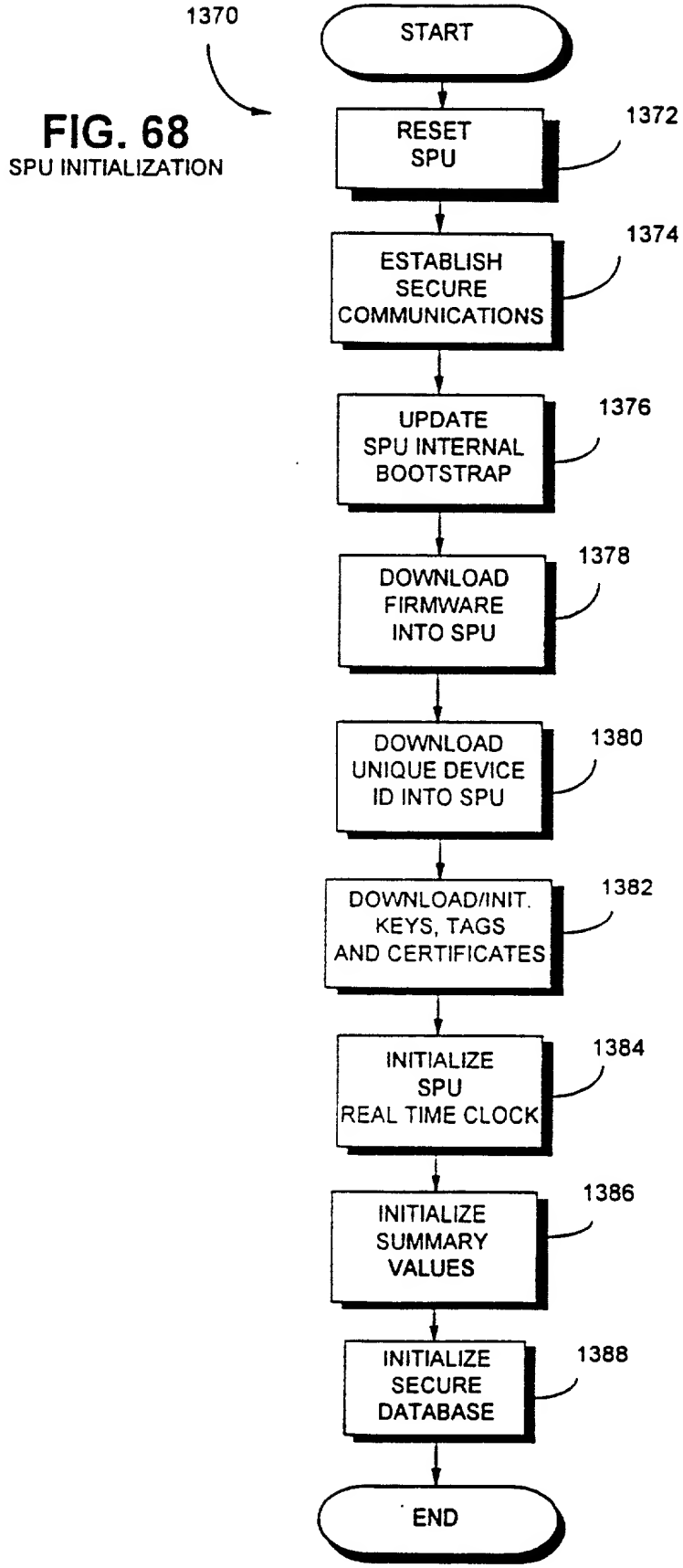


FIG. 68
SPU INITIALIZATION

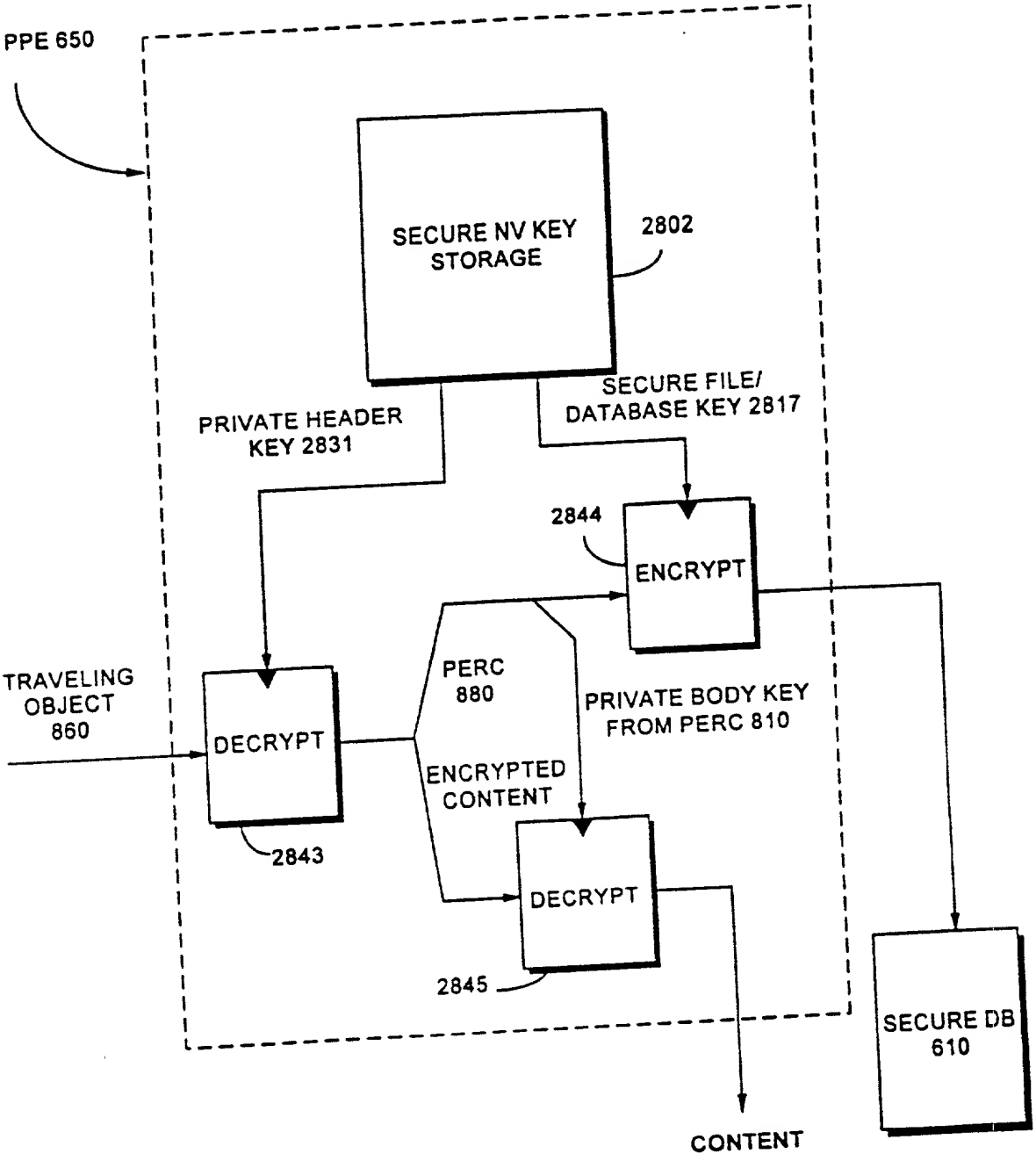


FIG. 67 TRAVELING OBJECT DECRYPTION

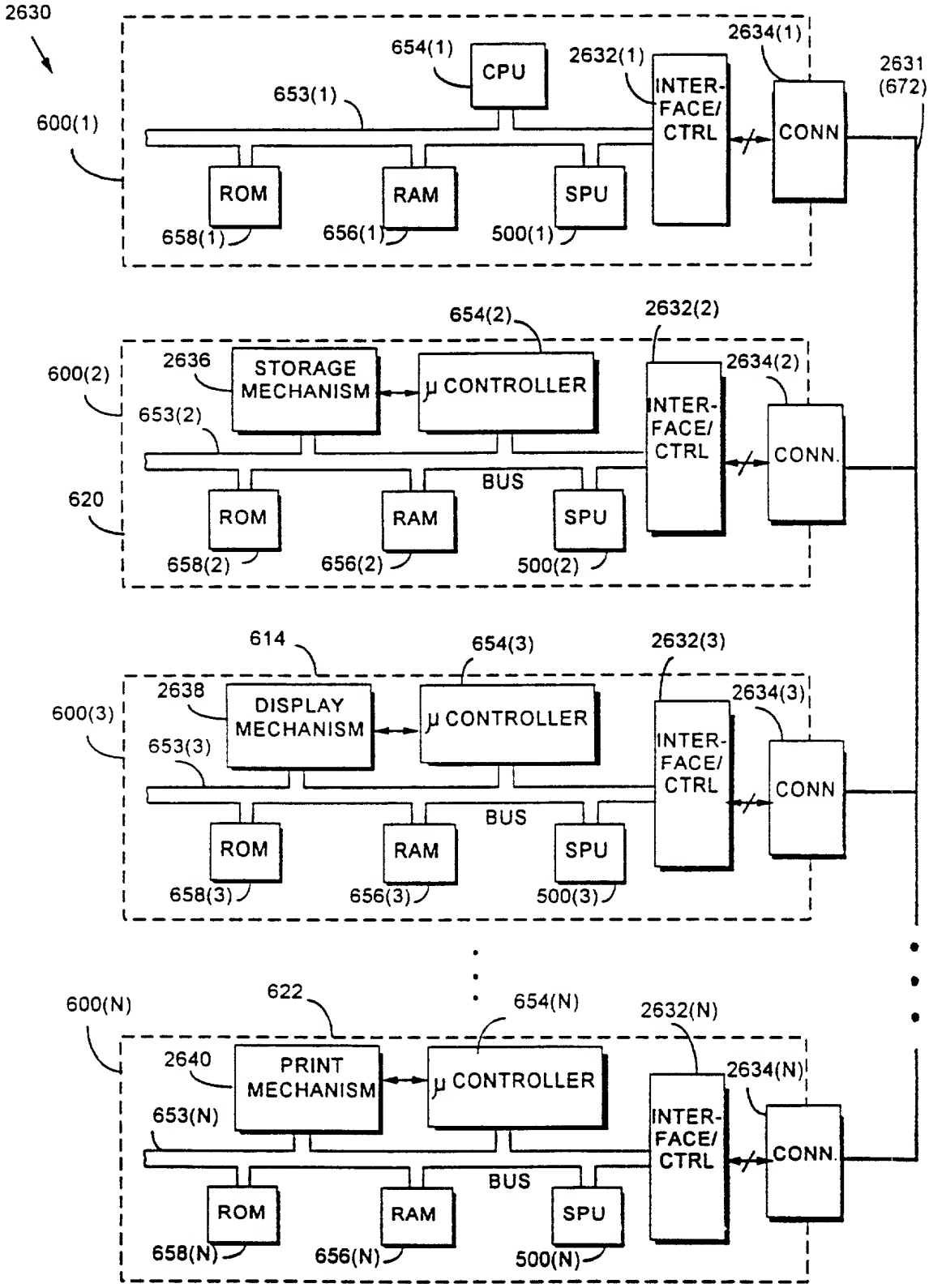

2630
600(1)
654(1)
CPU
653(1)
2632(1)
INTER-FACE/ CTRL
2634(1)
CONN
2631 (672)
ROM
RAM
SPU
658(1)
656(1)
500(1)
654(2)
2632(2)
600(2)
2636
STORAGE MECHANISM
μ CONTROLLER
2634(2)
653(2)
INTER-FACE/ CTRL
CONN.
BUS
620
ROM
RAM
SPU
658(2)
656(2)
500(2)
614
654(3)
2632(3)
600(3)
2638
DISPLAY MECHANISM
μ CONTROLLER
2634(3)
653(3)
INTER-FACE/ CTRL
CONN
BUS
ROM
RAM
SPU
658(3)
656(3)
500(3)
600(N)
622
654(N)
2632(N)
2640
PRINT MECHANISM
μ CONTROLLER
2634(N)
653(N)
INTER-FACE/ CTRL
CONN.
BUS
ROM
RAM
SPU
658(N)
656(N)
500(N)

FIG. 70

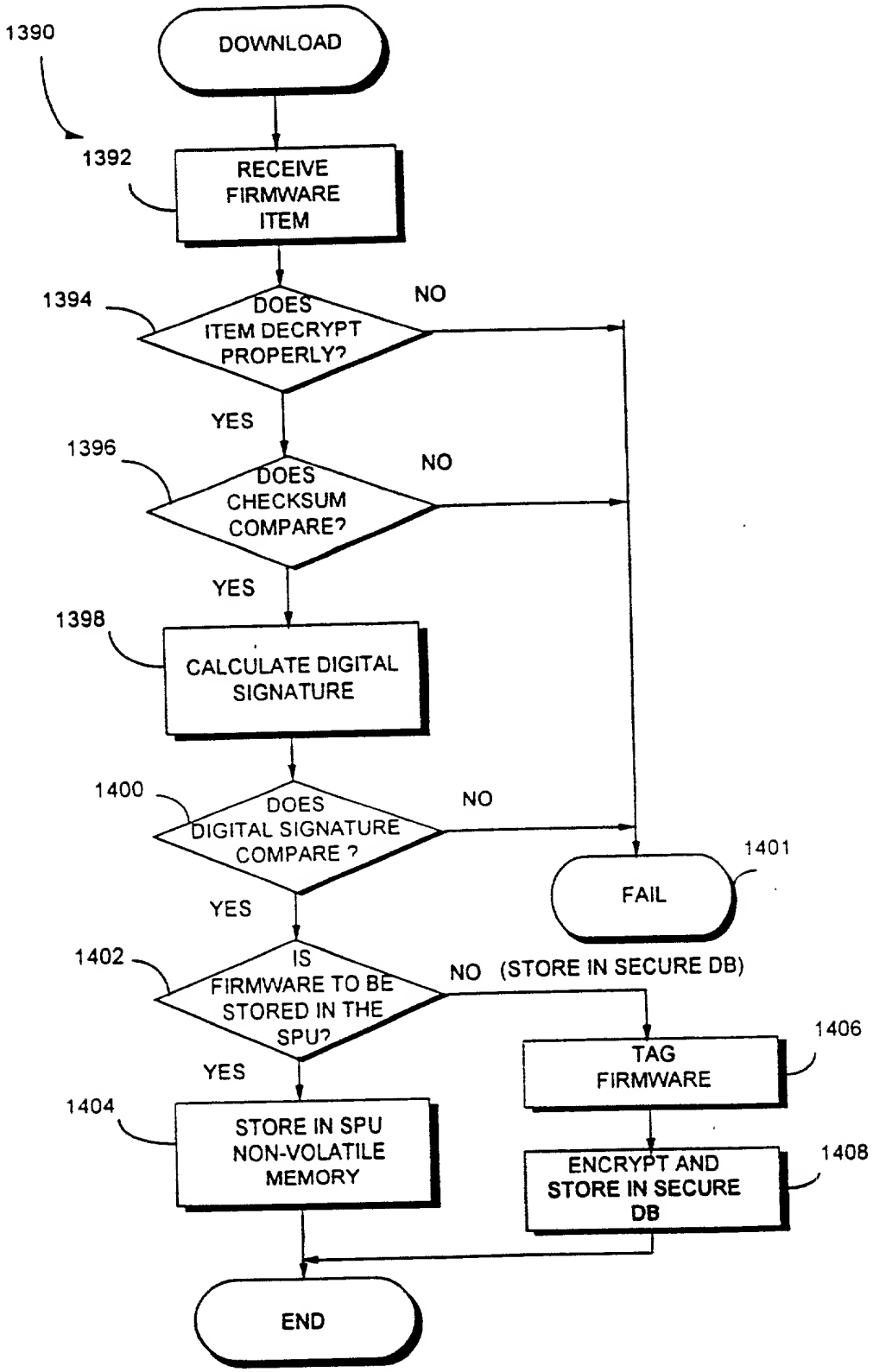


FIG. 69

SPU FIRMWARE DOWNLOAD

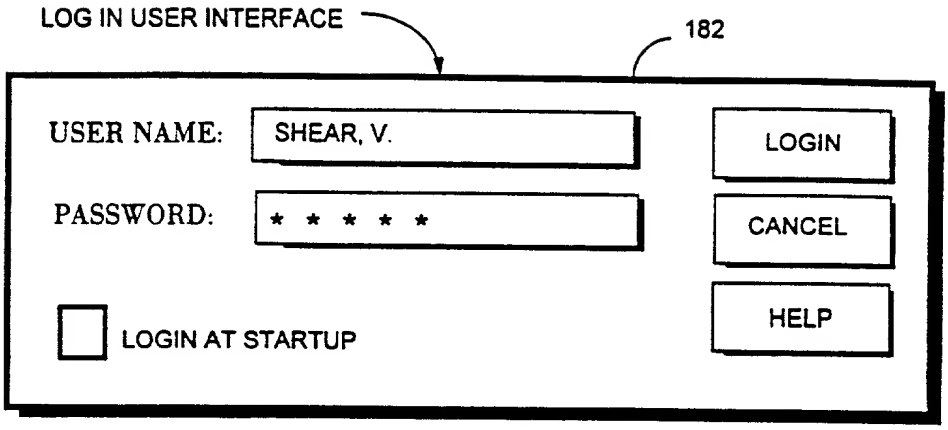
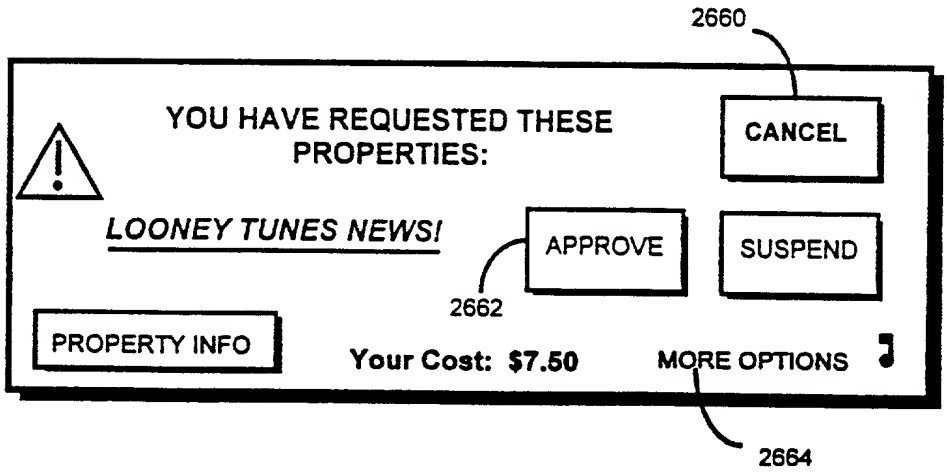


FIG. 72A

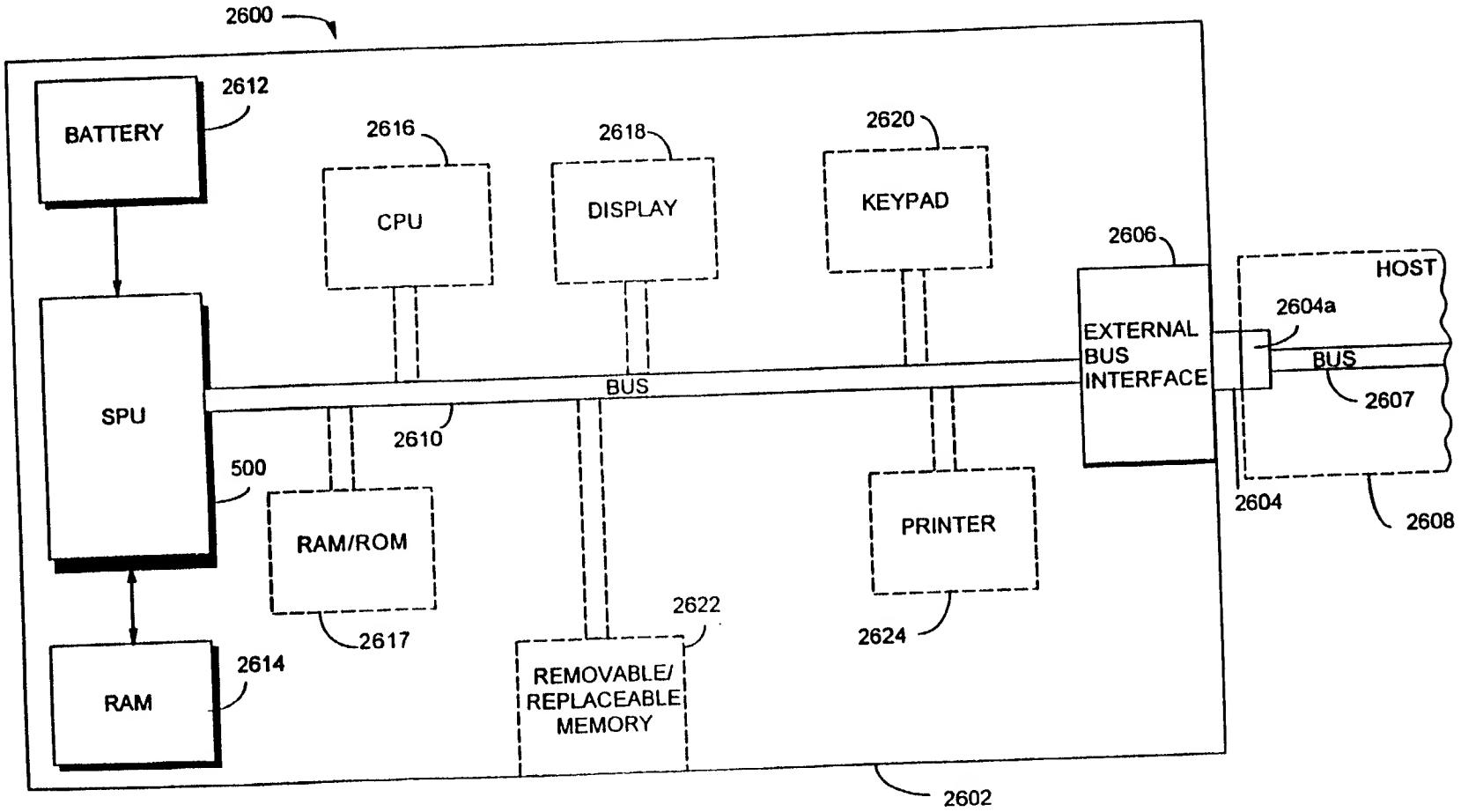
FIG. 72B



PCT/US2005/025250

FIG. 71

PORTABLE APPLIANCE



PCT/US97/23260

FIG. 72D

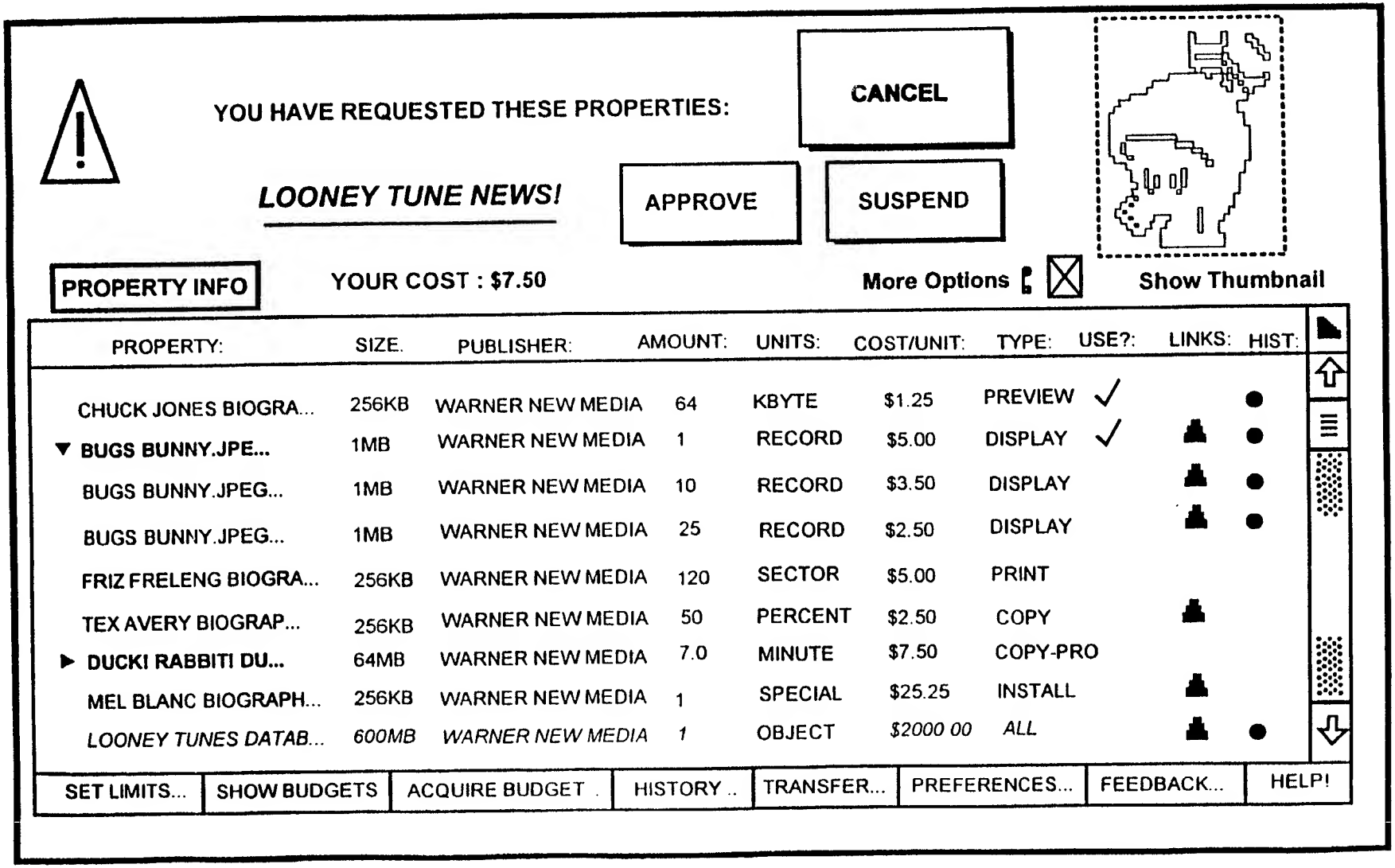


FIG. 72C

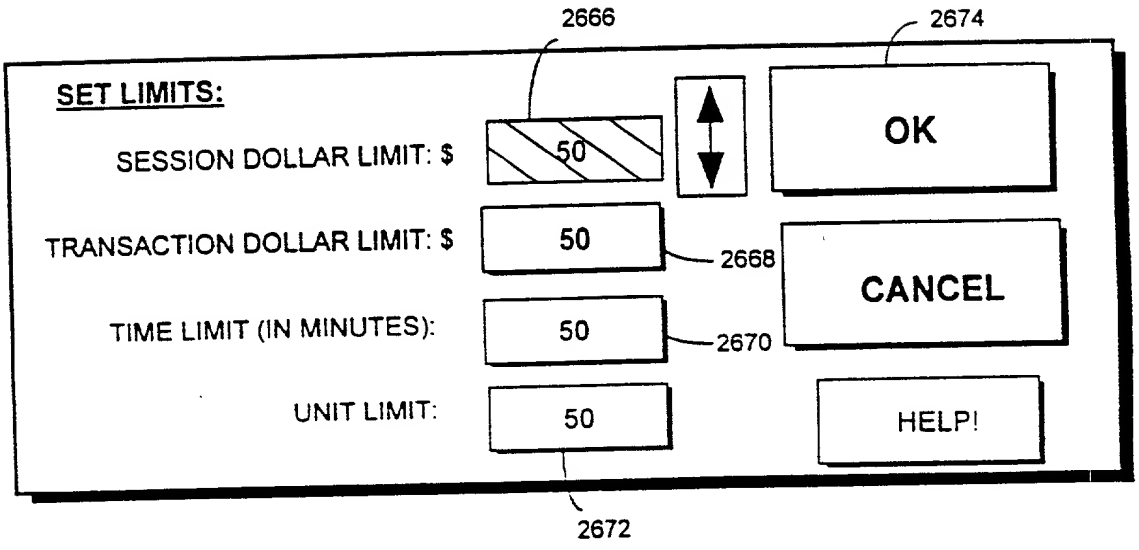

2666
2674
SET LIMITS:
SESSION DOLLAR LIMIT: $
50
OK
TRANSACTION DOLLAR LIMIT: $
50
2668
CANCEL
TIME LIMIT (IN MINUTES):
50
2670
UNIT LIMIT:
50
HELP!
2672

FIG. 74

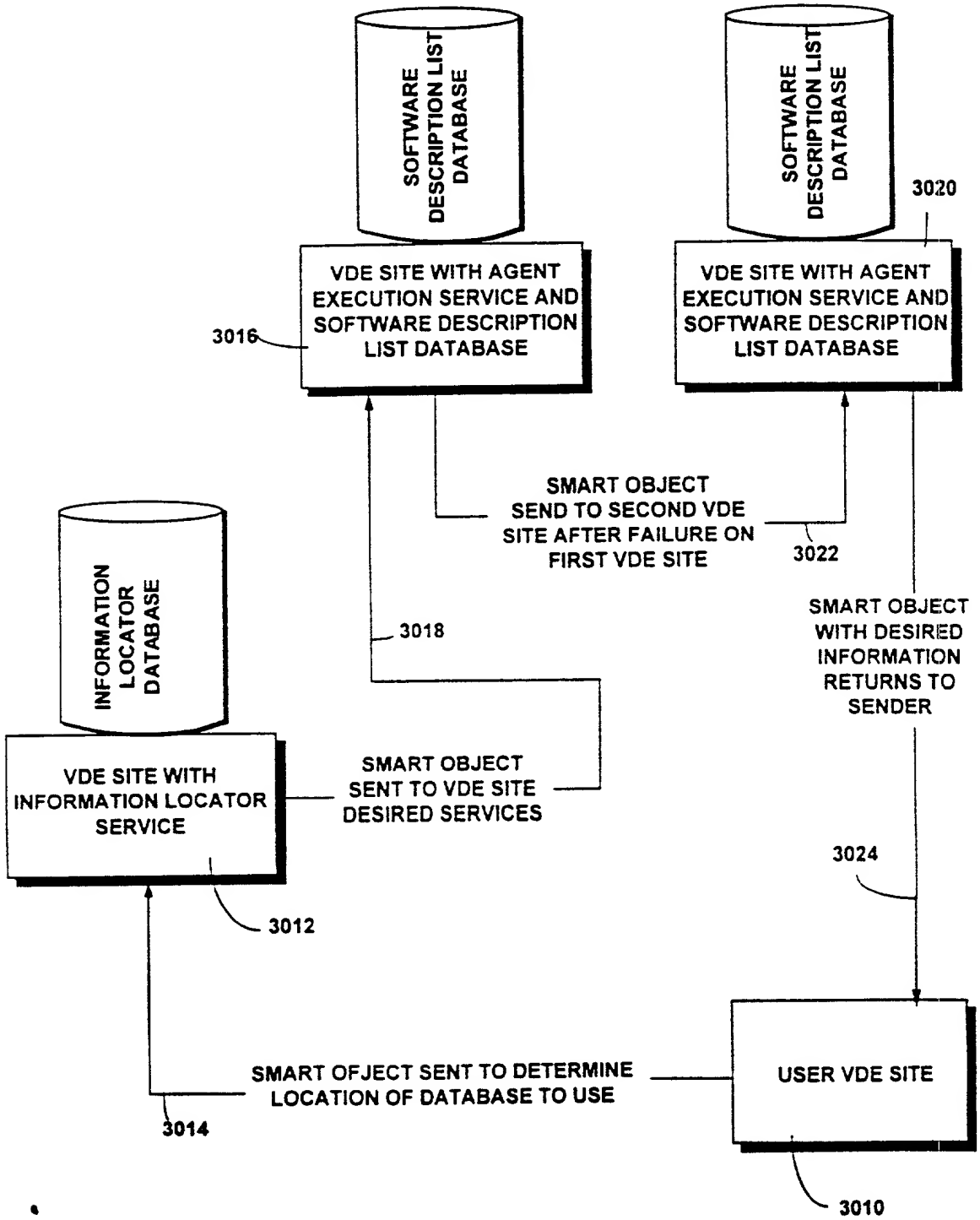

SOFTWARE DESCRIPTION LIST DATABASE
SOFTWARE DESCRIPTION LIST DATABASE
3020
VDE SITE WITH AGENT EXECUTION SERVICE AND SOFTWARE DESCRIPTION LIST DATABASE
3016
VDE SITE WITH AGENT EXECUTION SERVICE AND SOFTWARE DESCRIPTION LIST DATABASE
SMART OBJECT SEND TO SECOND VDE SITE AFTER FAILURE ON FIRST VDE SITE
3022
INFORMATION LOCATOR DATABASE
3018
SMART OBJECT WITH DESIRED INFORMATION RETURNS TO SENDER
VDE SITE WITH INFORMATION LOCATOR SERVICE
SMART OBJECT SENT TO VDE SITE DESIRED SERVICES
3024
3012
SMART OFJECT SENT TO DETERMINE LOCATION OF DATABASE TO USE
USER VDE SITE
3014
3010

FIG. 73

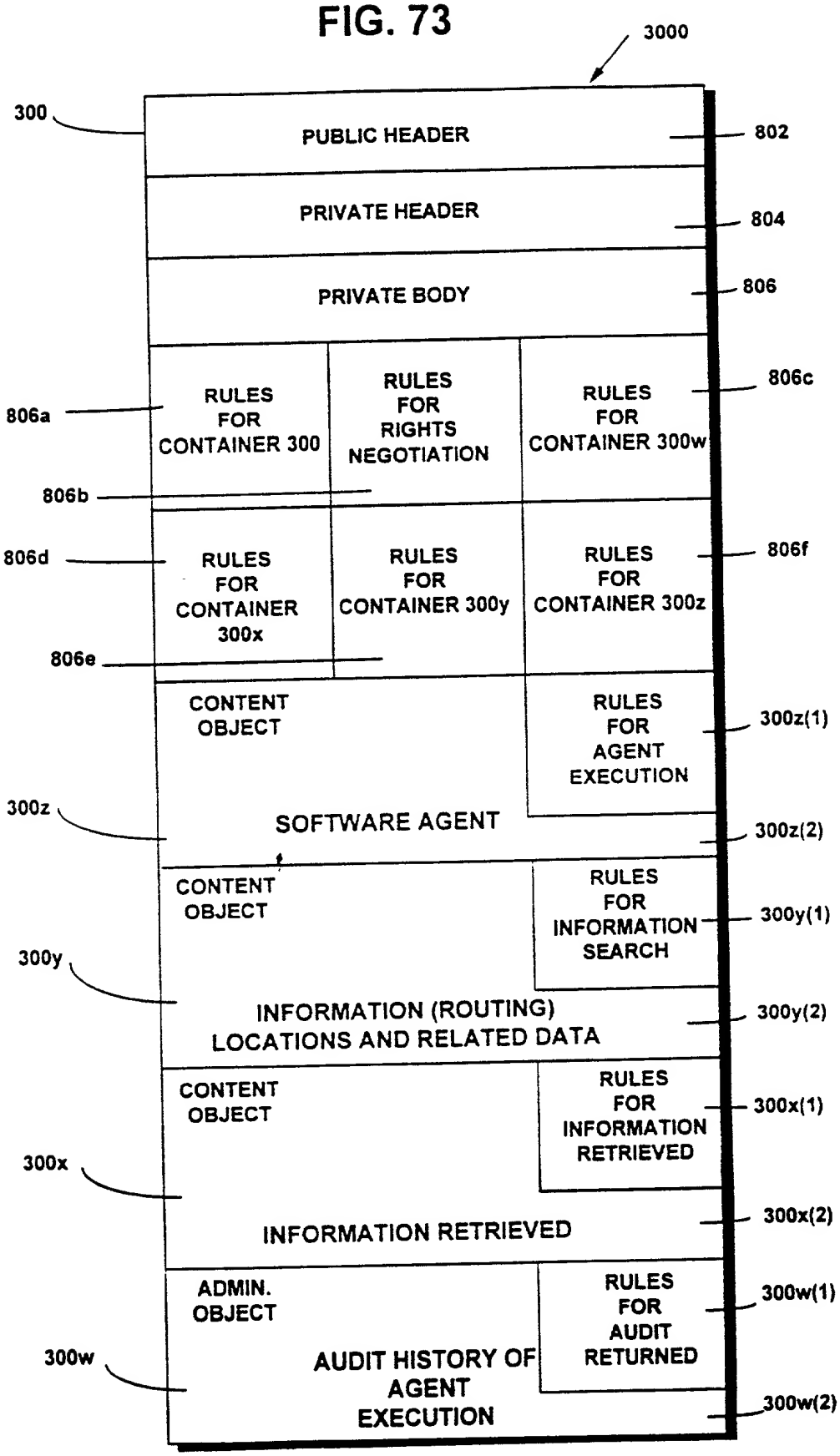

3000
300
PUBLIC HEADER
802
PRIVATE HEADER
804
PRIVATE BODY
806
RULES FOR CONTAINER 300
RULES FOR RIGHTS NEGOTIATION
RULES FOR CONTAINER 300w
806a
806b
806c
RULES FOR CONTAINER 300x
RULES FOR CONTAINER 300y
RULES FOR CONTAINER 300z
806d
806e
806f
CONTENT OBJECT
RULES FOR AGENT EXECUTION
300z(1)
300z
SOFTWARE AGENT
300z(2)
CONTENT OBJECT
RULES FOR INFORMATION SEARCH
300y(1)
300y
INFORMATION (ROUTING) LOCATIONS AND RELATED DATA
300y(2)
CONTENT OBJECT
RULES FOR INFORMATION RETRIEVED
300x(1)
300x
INFORMATION RETRIEVED
300x(2)
ADMIN. OBJECT
RULES FOR AUDIT RETURNED
300w(1)
300w
AUDIT HISTORY OF AGENT EXECUTION
300w(2)

FIG. 75B

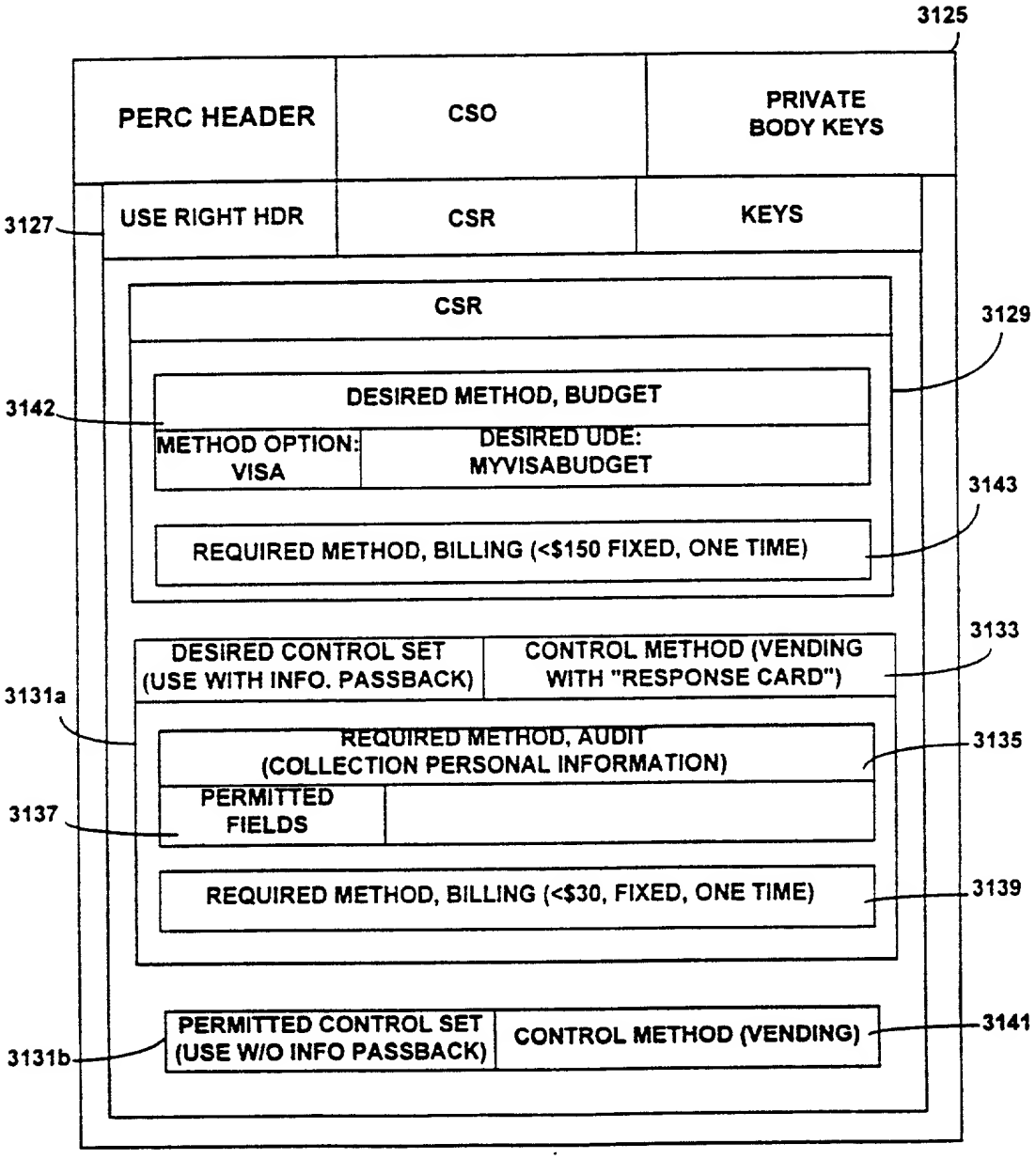

3125
PERC HEADER
CSO
PRIVATE BODY KEYS
3127
USE RIGHT HDR
CSR
KEYS
CSR
3129
DESIRED METHOD, BUDGET
3142
METHOD OPTION: VISA
DESIRED UDE: MYVISABUDGET
3143
REQUIRED METHOD, BILLING (<$150 FIXED, ONE TIME)
DESIRED CONTROL SET (USE WITH INFO. PASSBACK)
CONTROL METHOD (VENDING WITH "RESPONSE CARD")
3133
3131a
REQUIRED METHOD, AUDIT (COLLECTION PERSONAL INFORMATION)
3135
3137
PERMITTED FIELDS
REQUIRED METHOD, BILLING (<$30, FIXED, ONE TIME)
3139
PERMITTED CONTROL SET (USE W/O INFO PASSBACK)
CONTROL METHOD (VENDING)
3141
3131b

FIG. 75A

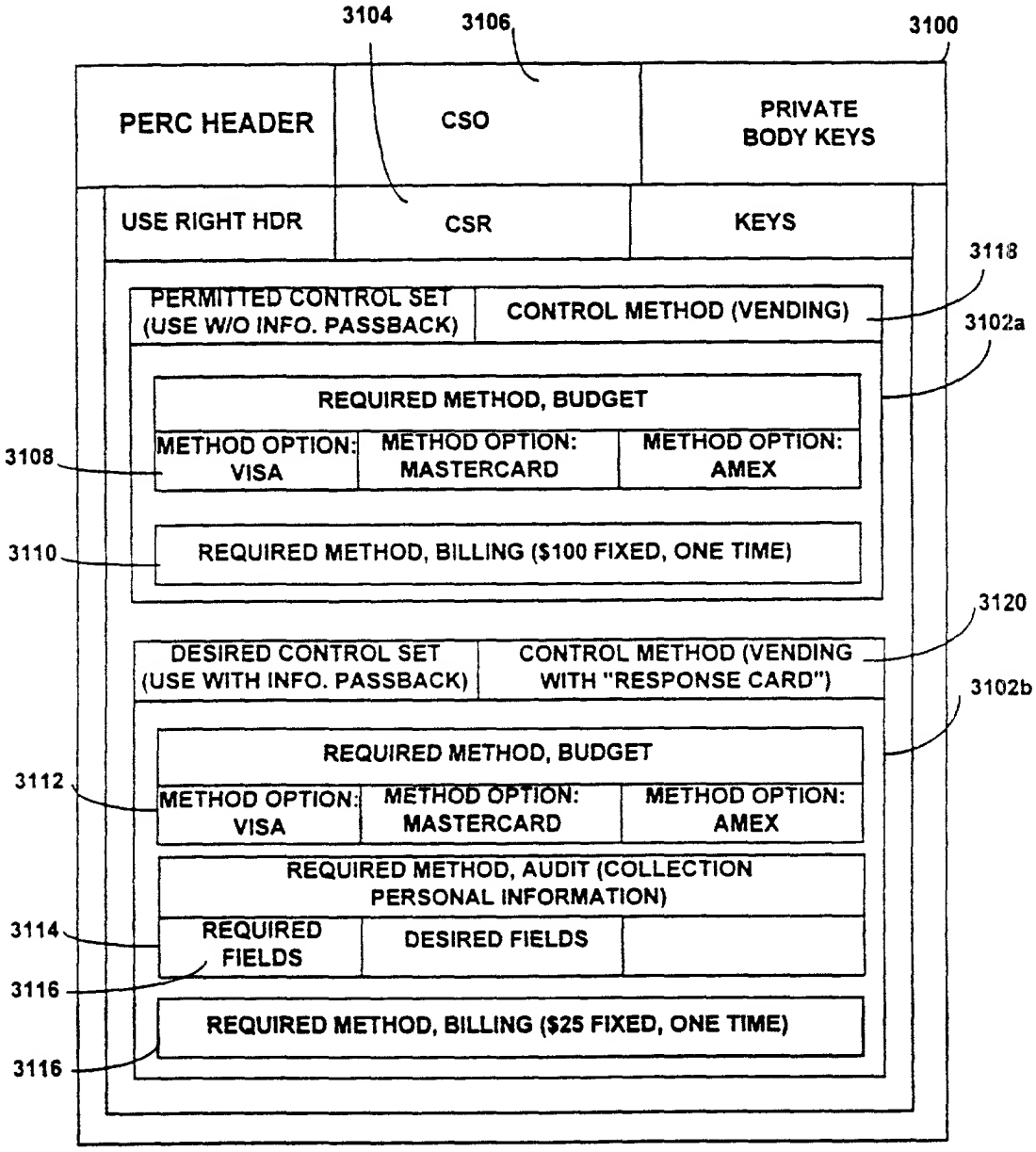

3104
3106
3100
PERC HEADER
CSO
PRIVATE BODY KEYS
USE RIGHT HDR
CSR
KEYS
3118
PERMITTED CONTROL SET (USE W/O INFO. PASSBACK)
CONTROL METHOD (VENDING)
3102a
REQUIRED METHOD, BUDGET
3108
METHOD OPTION: VISA
METHOD OPTION: MASTERCARD
METHOD OPTION: AMEX
3110
REQUIRED METHOD, BILLING ($100 FIXED, ONE TIME)
3120
DESIRED CONTROL SET (USE WITH INFO. PASSBACK)
CONTROL METHOD (VENDING WITH "RESPONSE CARD")
3102b
REQUIRED METHOD, BUDGET
3112
METHOD OPTION: VISA
METHOD OPTION: MASTERCARD
METHOD OPTION: AMEX
REQUIRED METHOD, AUDIT (COLLECTION PERSONAL INFORMATION)
3114
REQUIRED FIELDS
DESIRED FIELDS
3116
REQUIRED METHOD, BILLING ($25 FIXED, ONE TIME)
3116

FIG. 75D

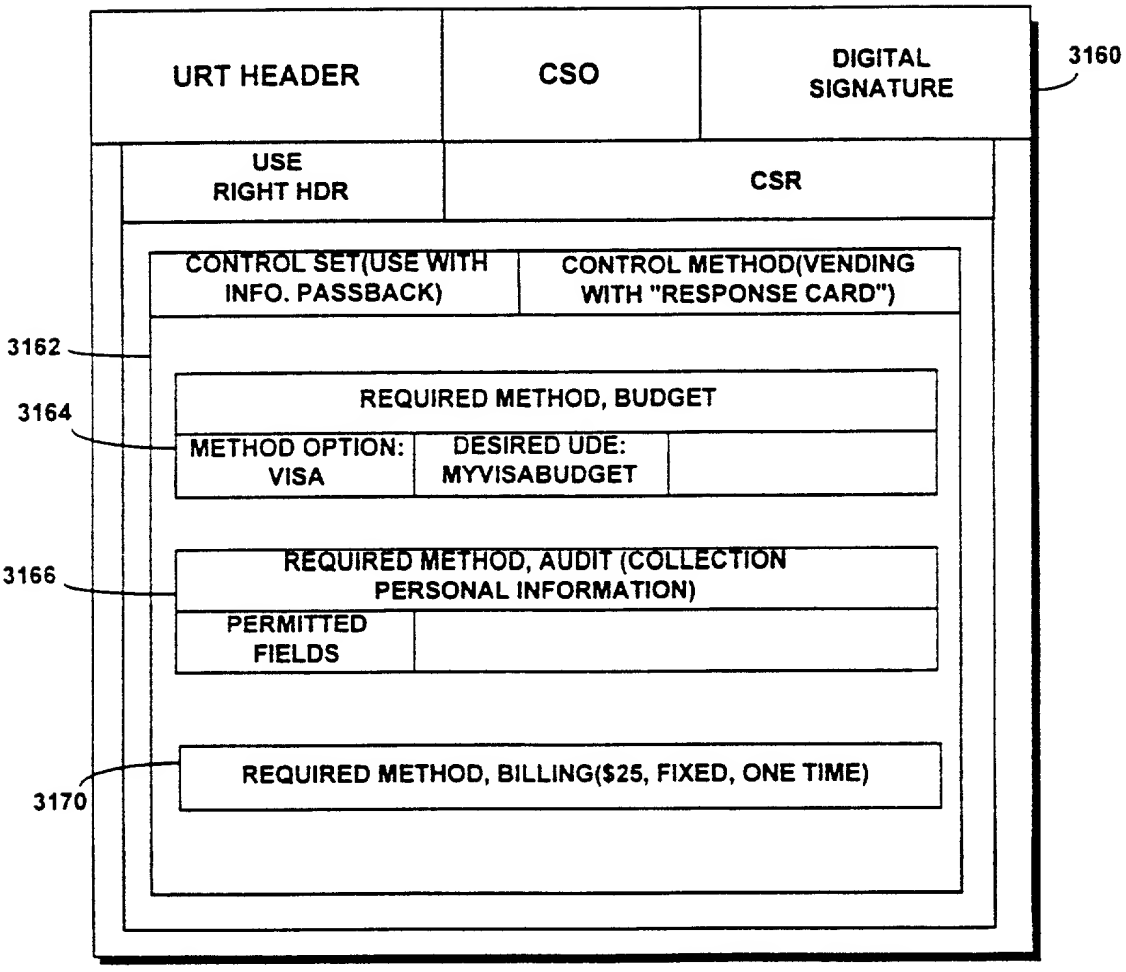

URT HEADER
CSO
DIGITAL SIGNATURE
3160
USE RIGHT HDR
CSR
CONTROL SET(USE WITH INFO. PASSBACK)
CONTROL METHOD(VENDING WITH "RESPONSE CARD")
3162
REQUIRED METHOD, BUDGET
3164
METHOD OPTION: VISA
DESIRED UDE: MYVISABUDGET
3166
REQUIRED METHOD, AUDIT (COLLECTION PERSONAL INFORMATION)
PERMITTED FIELDS
3170
REQUIRED METHOD, BILLING($25, FIXED, ONE TIME)

FIG. 75C

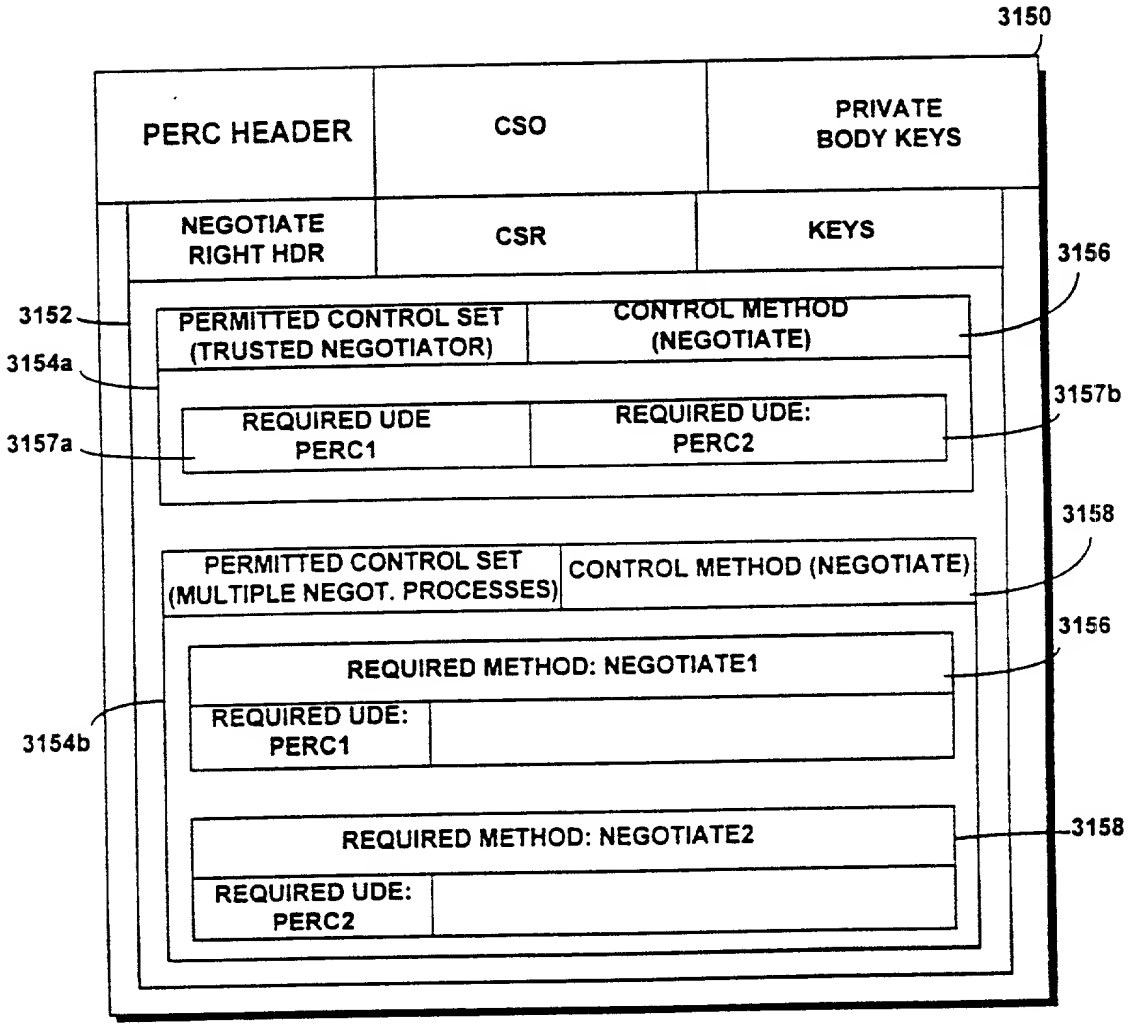
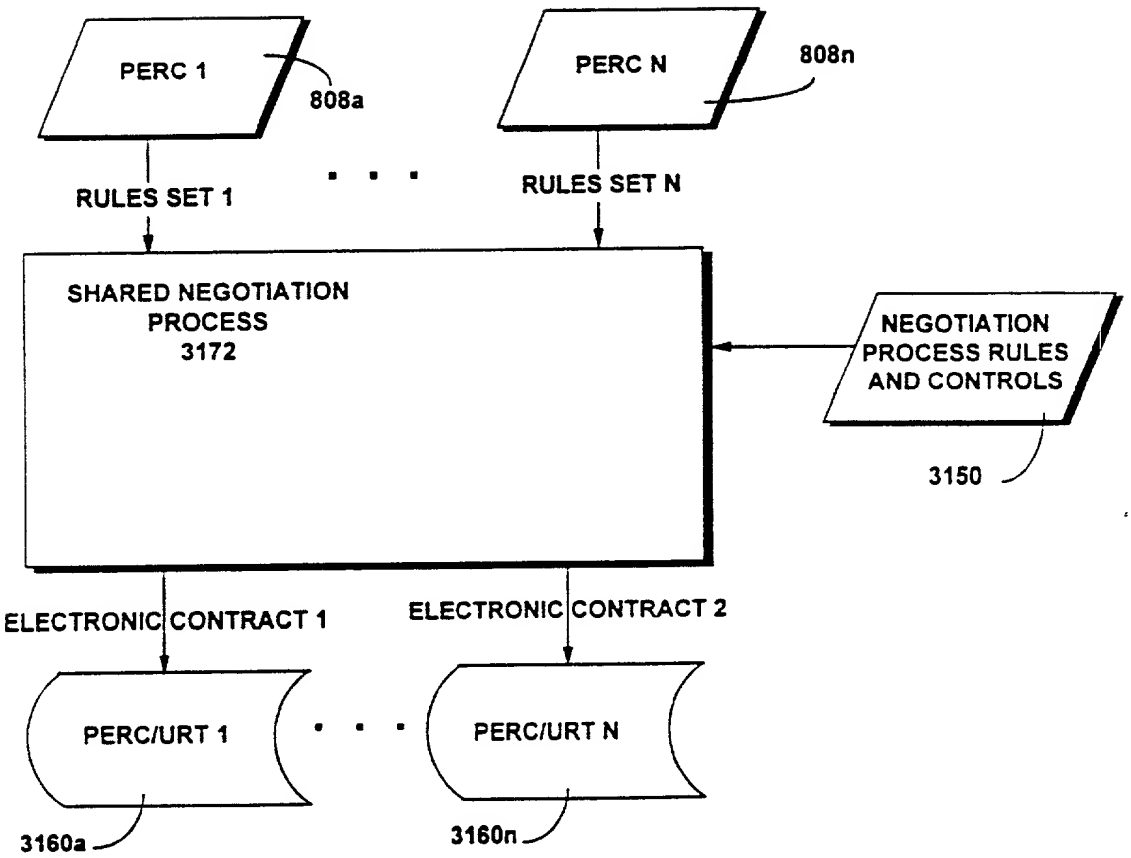

3150
PERC HEADER
CSO
PRIVATE BODY KEYS
NEGOTIATE RIGHT HDR
CSR
KEYS
3156
3152
PERMITTED CONTROL SET (TRUSTED NEGOTIATOR)
CONTROL METHOD (NEGOTIATE)
3154a
3157b
REQUIRED UDE PERC1
REQUIRED UDE: PERC2
3157a
3158
PERMITTED CONTROL SET (MULTIPLE NEGOT. PROCESSES)
CONTROL METHOD (NEGOTIATE)
3156
REQUIRED METHOD: NEGOTIATE1
REQUIRED UDE: PERC1
3154b
REQUIRED METHOD: NEGOTIATE2
3158
REQUIRED UDE: PERC2

FIG. 76A


PERC 1
808a
PERC N
808n
RULES SET 1
RULES SET N
SHARED NEGOTIATION PROCESS 3172
NEGOTIATION PROCESS RULES AND CONTROLS
3150
ELECTRONIC CONTRACT 1
ELECTRONIC CONTRACT 2
PERC/URT 1
PERC/URT N
3160a
3160n

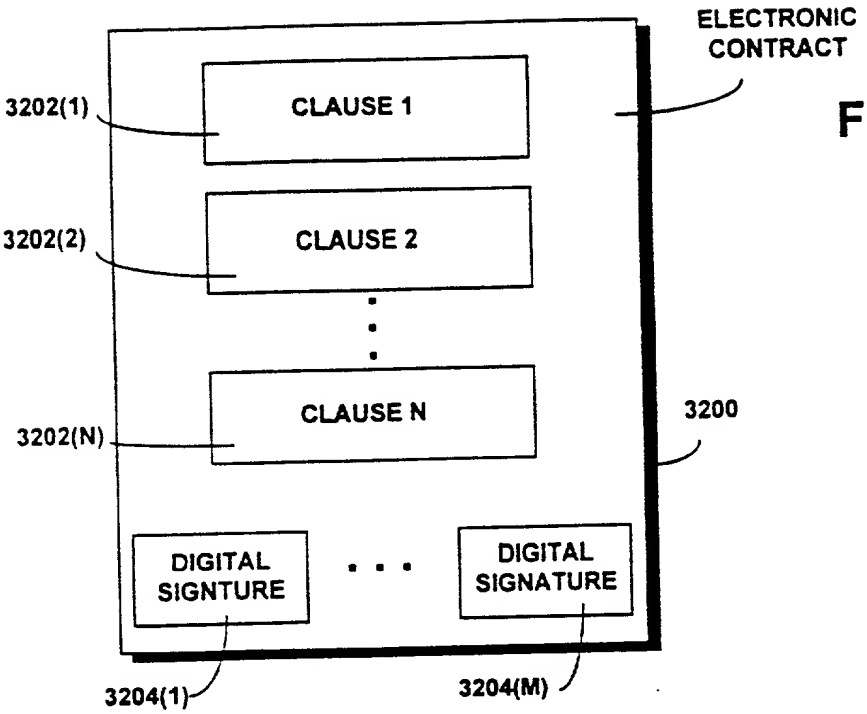


FIG. 75E

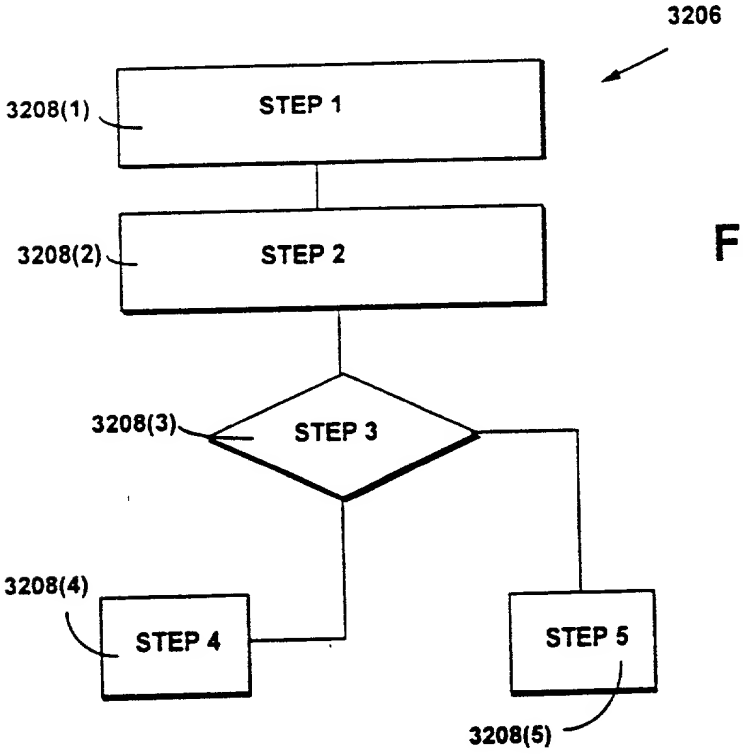


FIG. 75F

FIG. 77

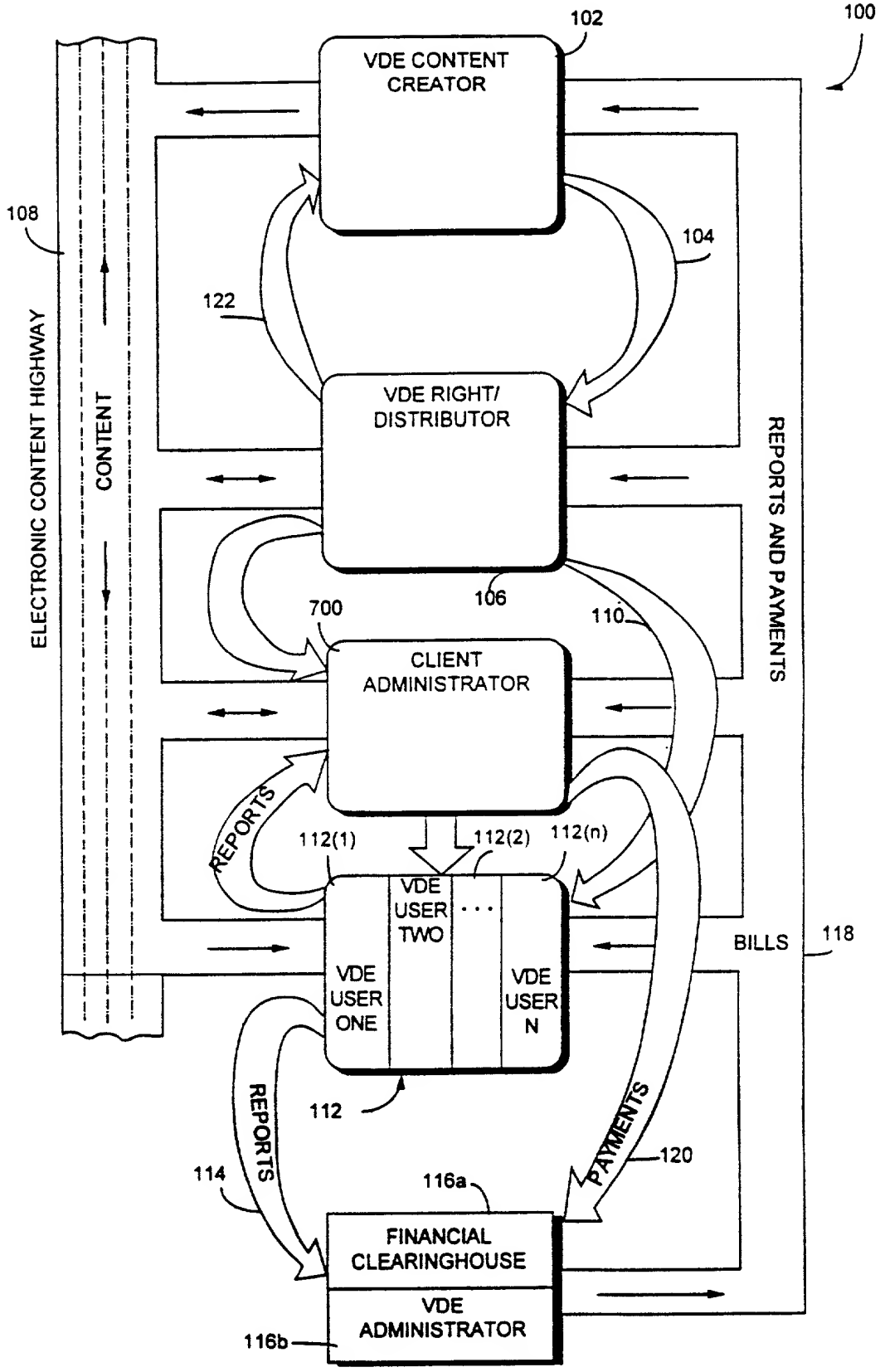

100
102
VDE CONTENT CREATOR
104
108
ELECTRONIC CONTENT HIGHWAY
CONTENT
122
VDE RIGHT/ DISTRIBUTOR
REPORTS AND PAYMENTS
106
700
110
CLIENT ADMINISTRATOR
REPORTS
112(1)
112(2)
112(n)
VDE USER ONE
VDE USER TWO
VDE USER N
BILLS
118
112
REPORTS
114
PAYMENTS
120
116a
FINANCIAL CLEARINGHOUSE
VDE ADMINISTRATOR
116b

FIG. 76B

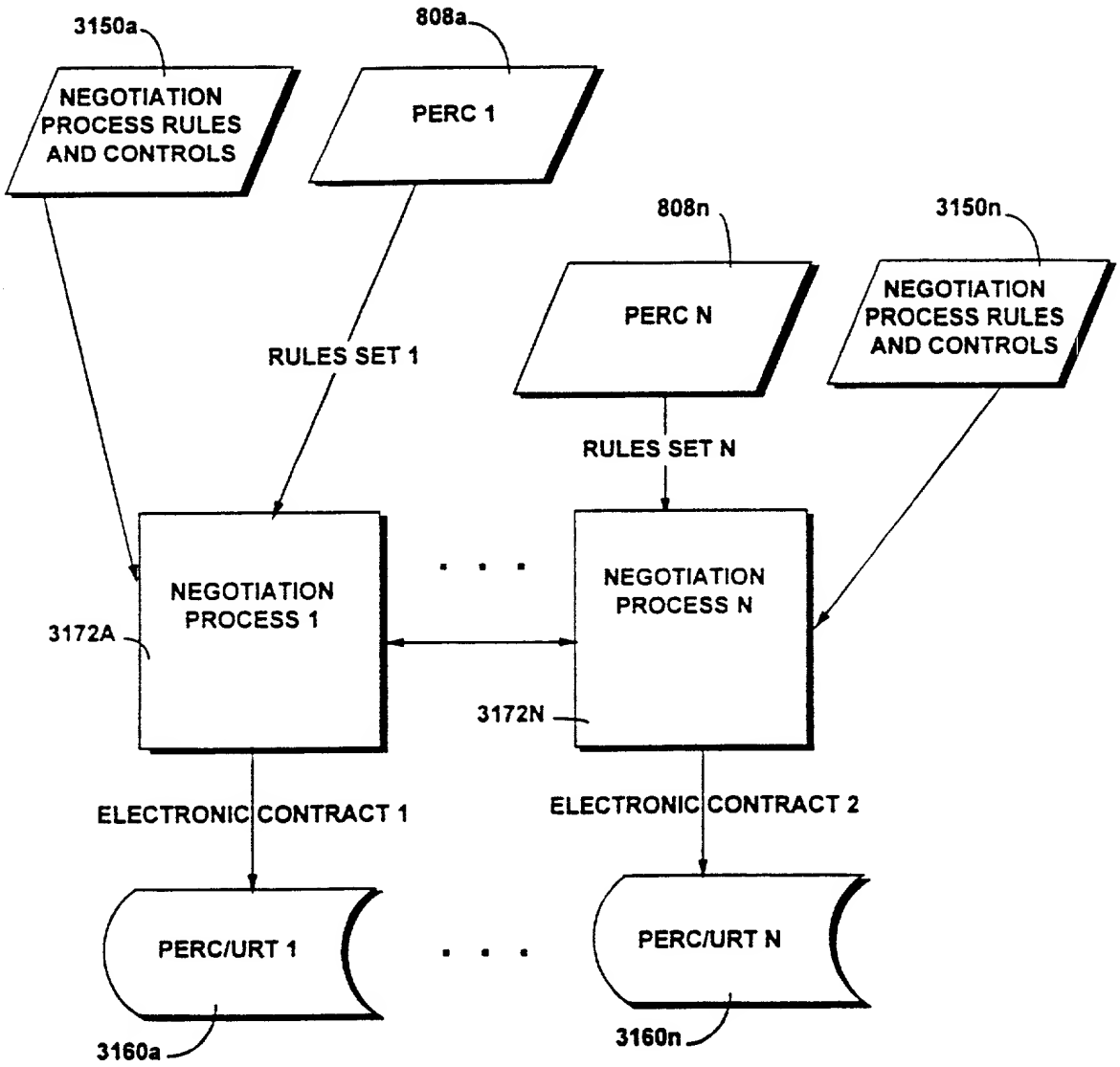
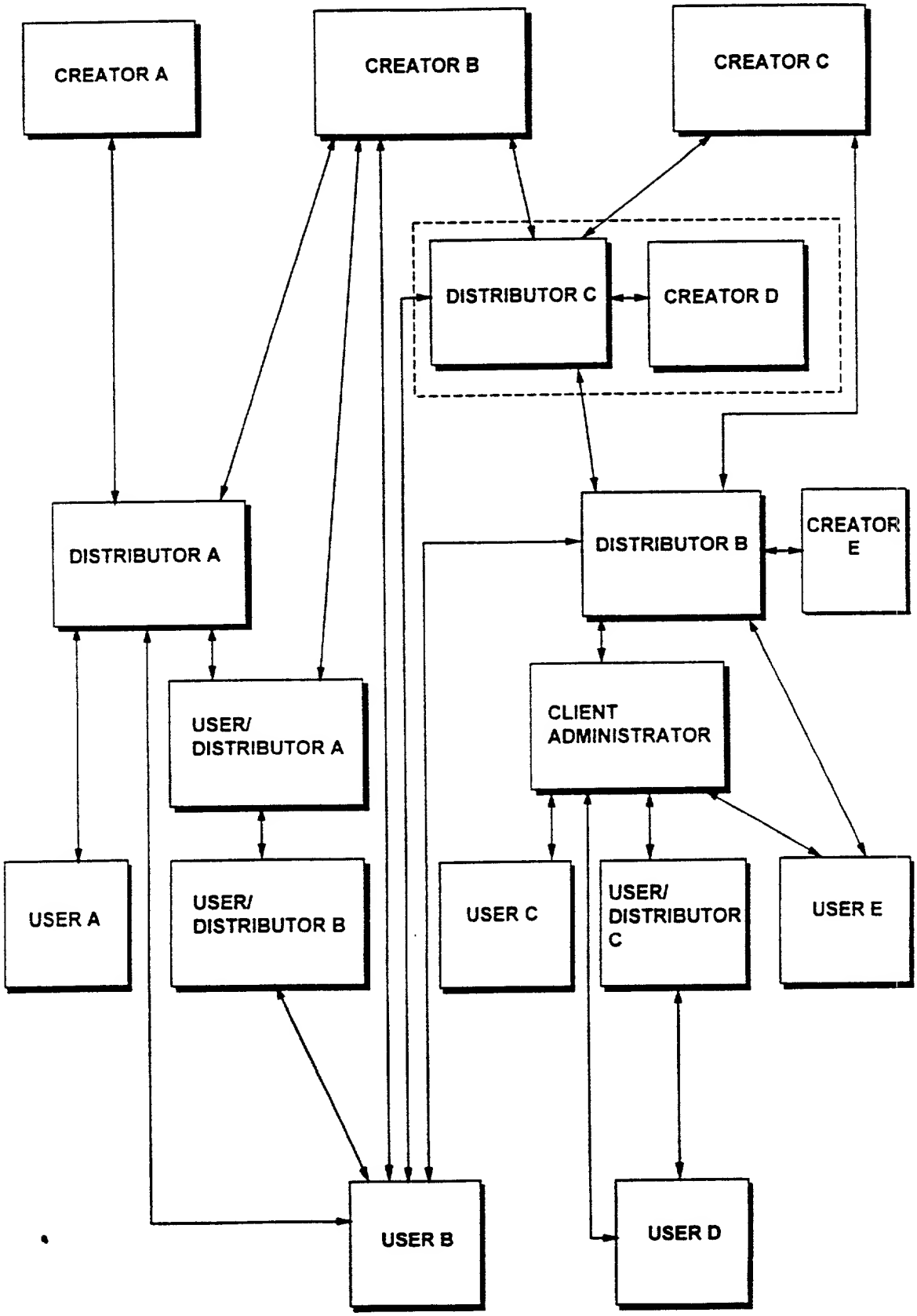

3150a
808a
NEGOTIATION PROCESS RULES AND CONTROLS
PERC 1
808n
3150n
PERC N
NEGOTIATION PROCESS RULES AND CONTROLS
RULES SET 1
RULES SET N
NEGOTIATION PROCESS 1
NEGOTIATION PROCESS N
3172A
3172N
ELECTRONIC CONTRACT 1
ELECTRONIC CONTRACT 2
PERC/URT 1
PERC/URT N
3160a
3160n

FIG. 79


CREATOR A
CREATOR B
CREATOR C
DISTRIBUTOR C
CREATOR D
DISTRIBUTOR A
DISTRIBUTOR B
CREATOR E
USER/ DISTRIBUTOR A
CLIENT ADMINISTRATOR
USER A
USER/ DISTRIBUTOR B
USER C
USER/ DISTRIBUTOR C
USER E
USER B
USER D

Adobe Systems

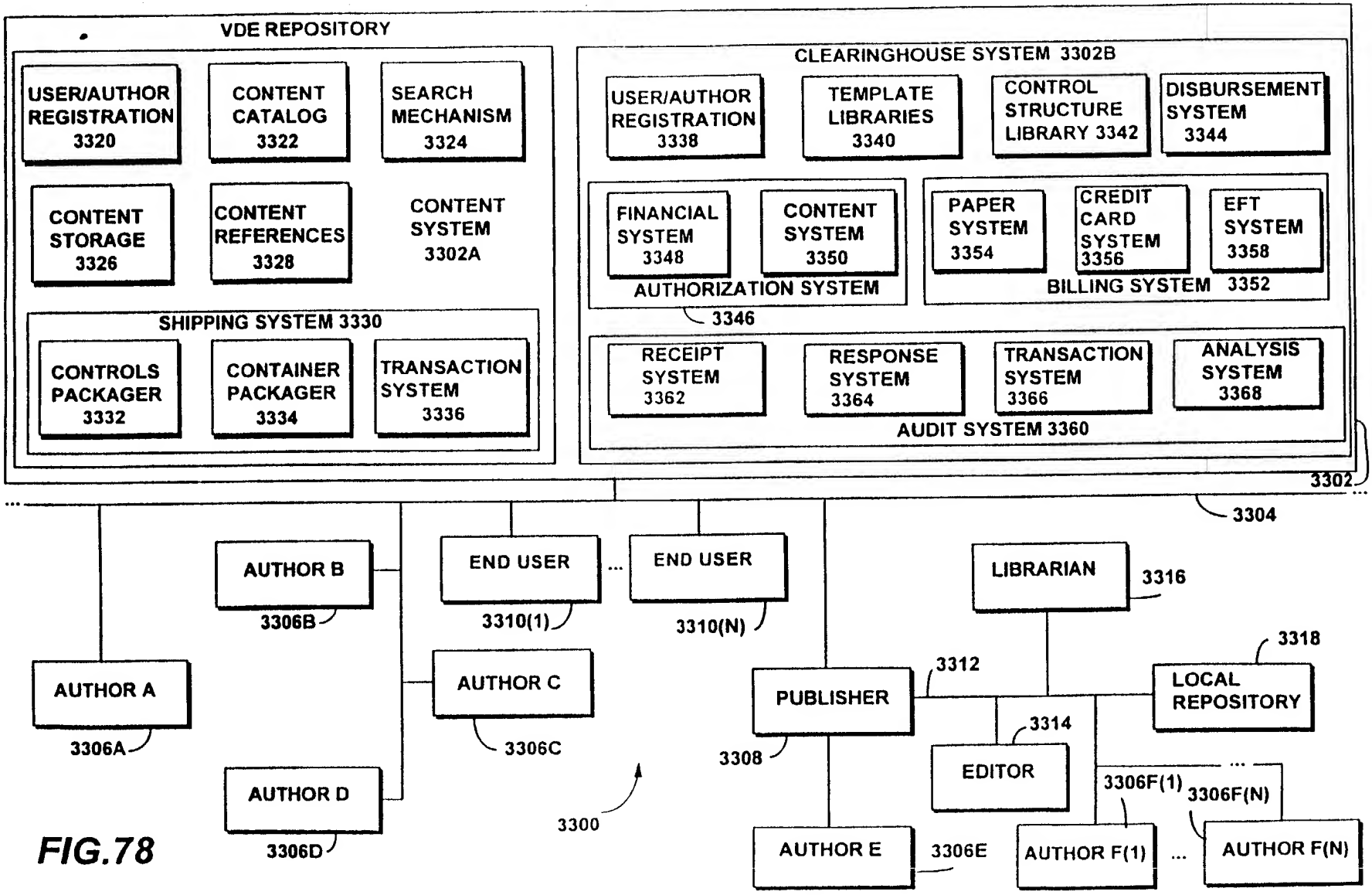


FIG.78

REDACTED

FIG. 81

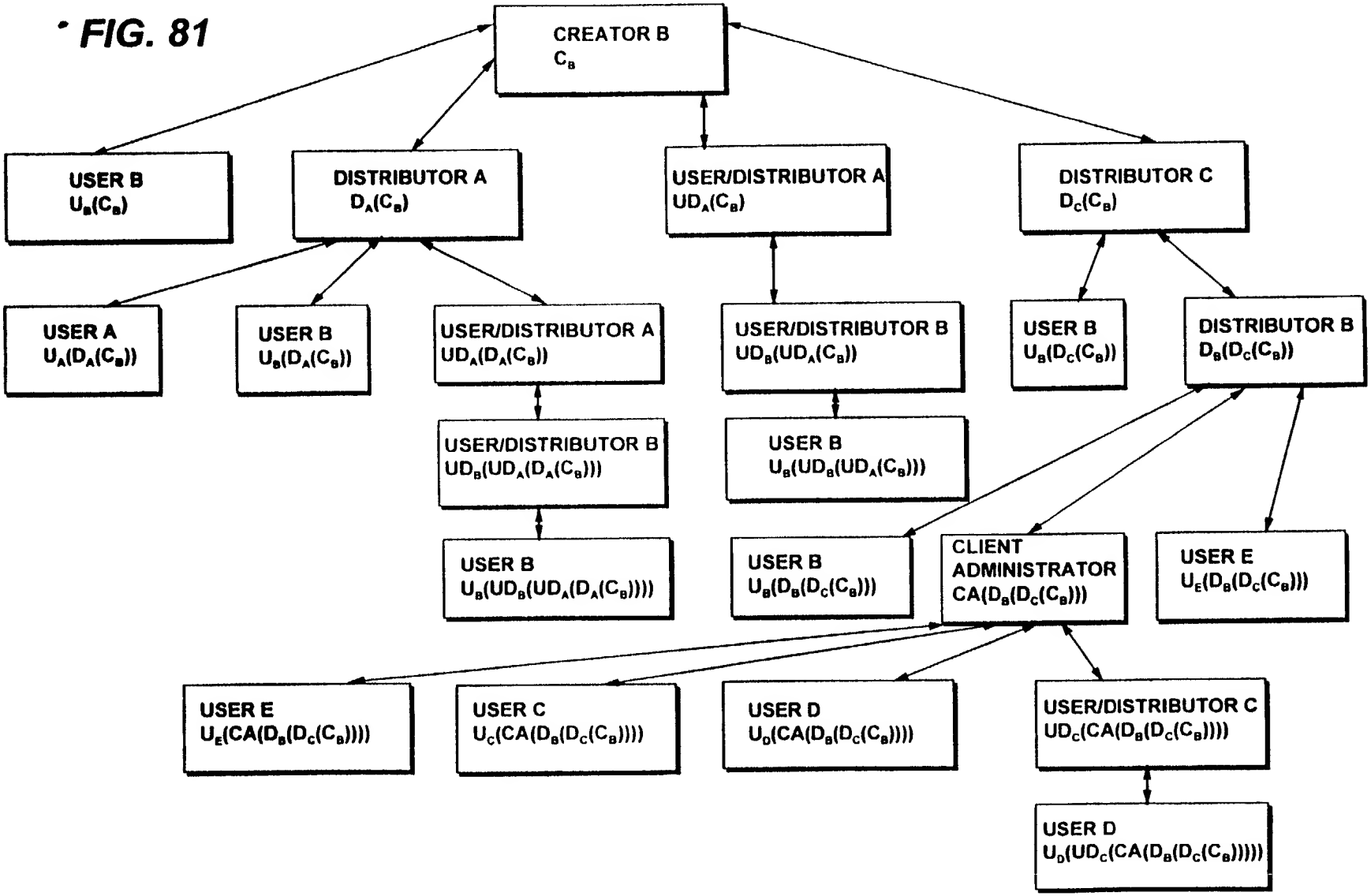


FIG. 80

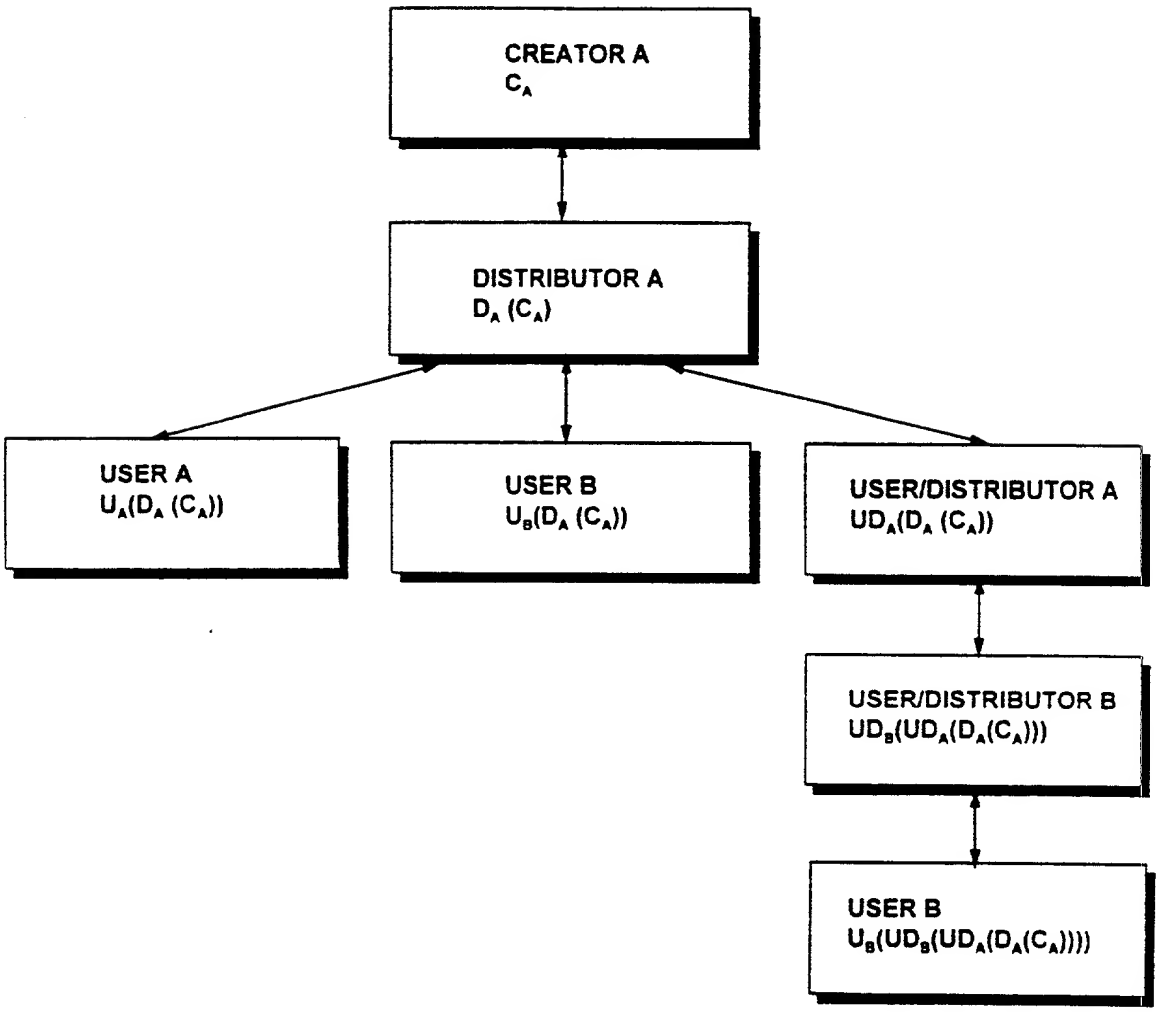
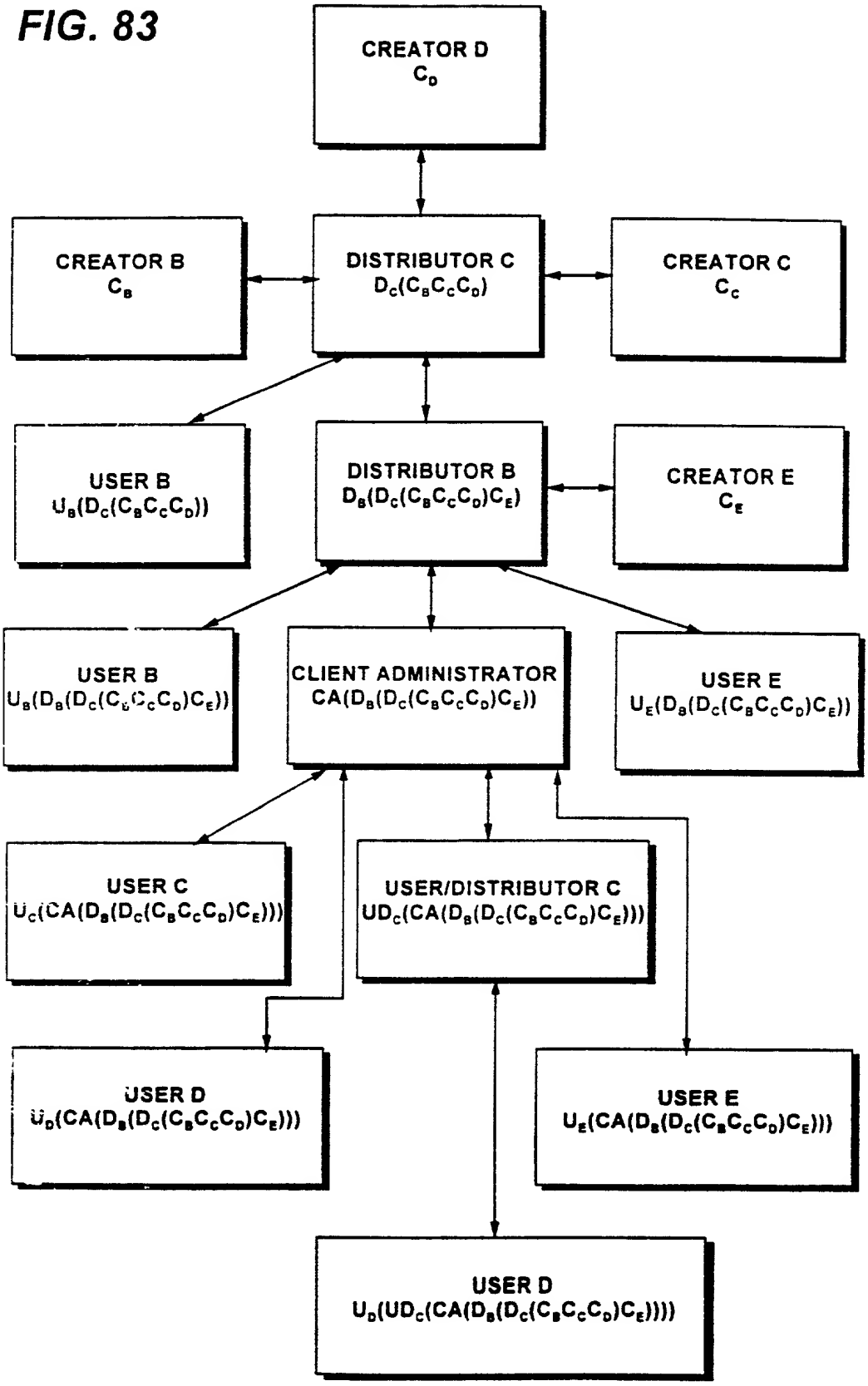

CREATOR A
C_A
DISTRIBUTOR A
$D_A (C_A)$
USER A
$U_A(D_A (C_A))$
USER B
$U_B(D_A (C_A))$
USER/DISTRIBUTOR A
$UD_A(D_A (C_A))$
USER/DISTRIBUTOR B
$UD_B(UD_A(D_A(C_A)))$
USER B
$U_B(UD_B(UD_A(D_A(C_A))))$

FIG. 83


CREATOR D
C_D
CREATOR B
C_B
DISTRIBUTOR C
$D_C(C_BC_CC_D)$
CREATOR C
C_C
USER B
$U_B(D_C(C_BC_CC_D))$
DISTRIBUTOR B
$D_B(D_C(C_BC_CC_D)C_E)$
CREATOR E
C_E
USER B
$U_B(D_B(D_C(C_BC_CC_D)C_E))$
CLIENT ADMINISTRATOR
$CA(D_B(D_C(C_BC_CC_D)C_E))$
USER E
$U_E(D_B(D_C(C_BC_CC_D)C_E))$
USER C
$U_C(CA(D_B(D_C(C_BC_CC_D)C_E)))$
USER/DISTRIBUTOR C
$UD_C(CA(D_B(D_C(C_BC_CC_D)C_E)))$
USER D
$U_D(CA(D_B(D_C(C_BC_CC_D)C_E)))$
USER E
$U_E(CA(D_B(D_C(C_BC_CC_D)C_E)))$
USER D
$U_D(UD_C(CA(D_B(D_C(C_BC_CC_D)C_E))))$

Tested Scanned

FIG. 82

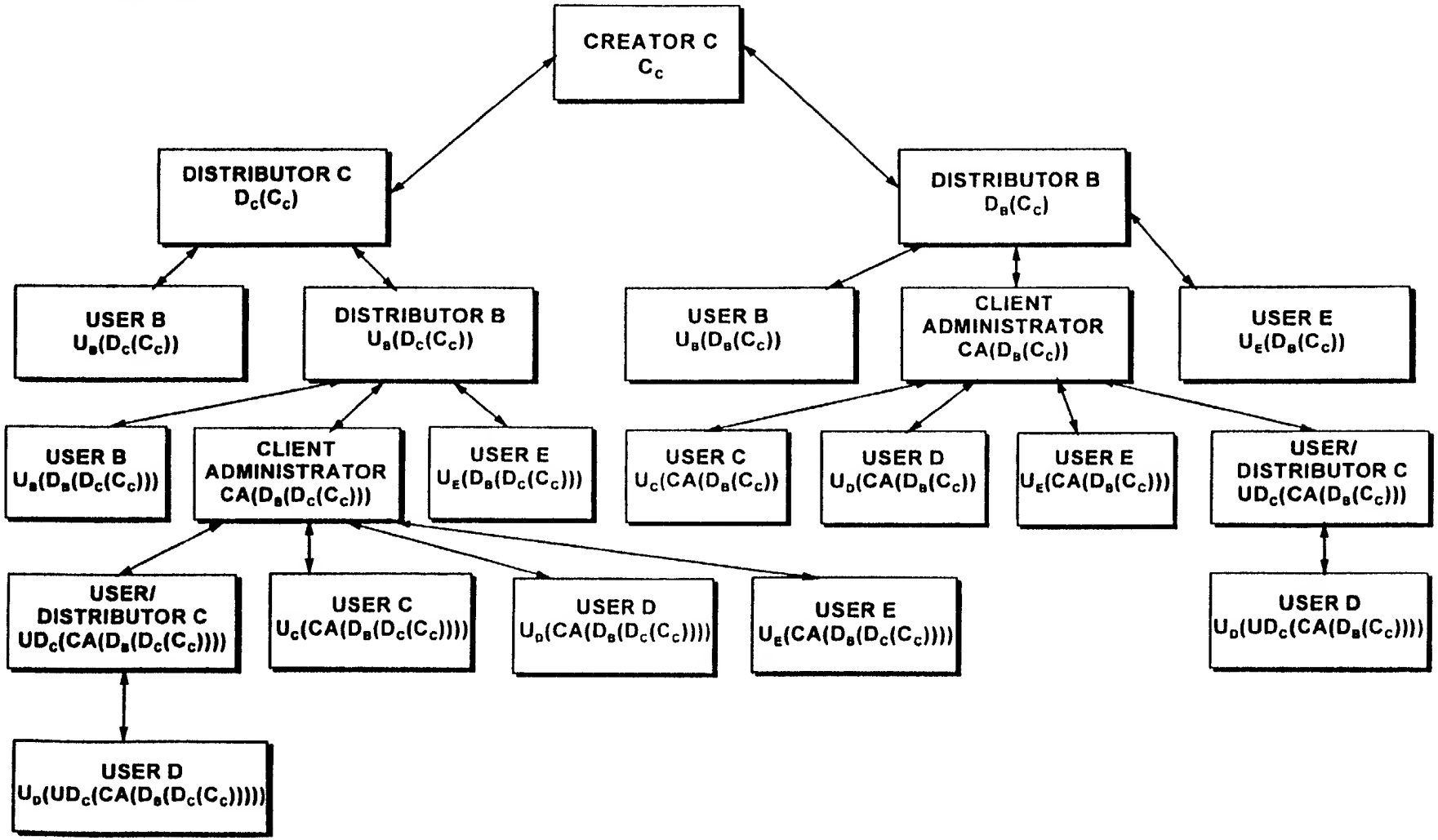
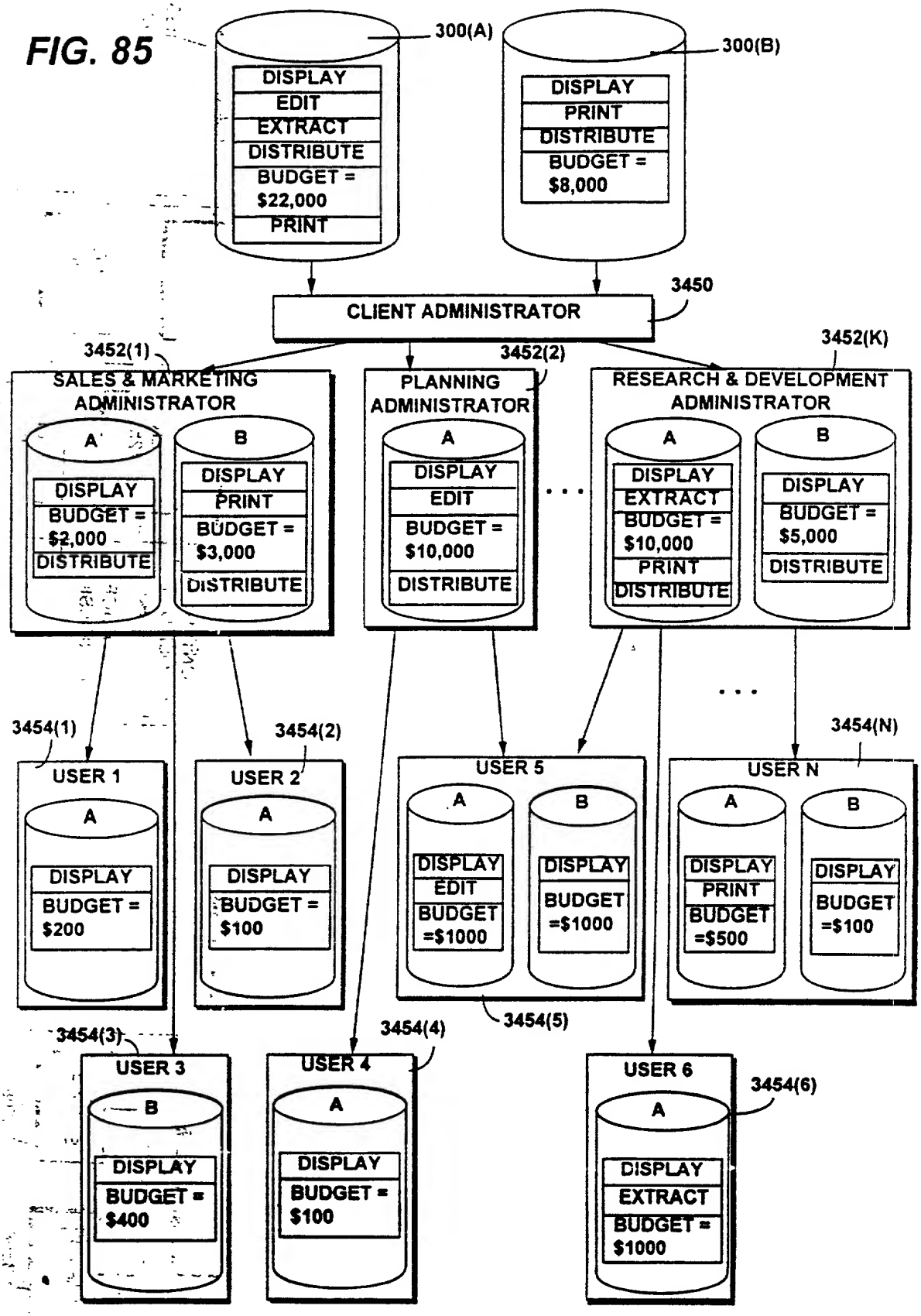
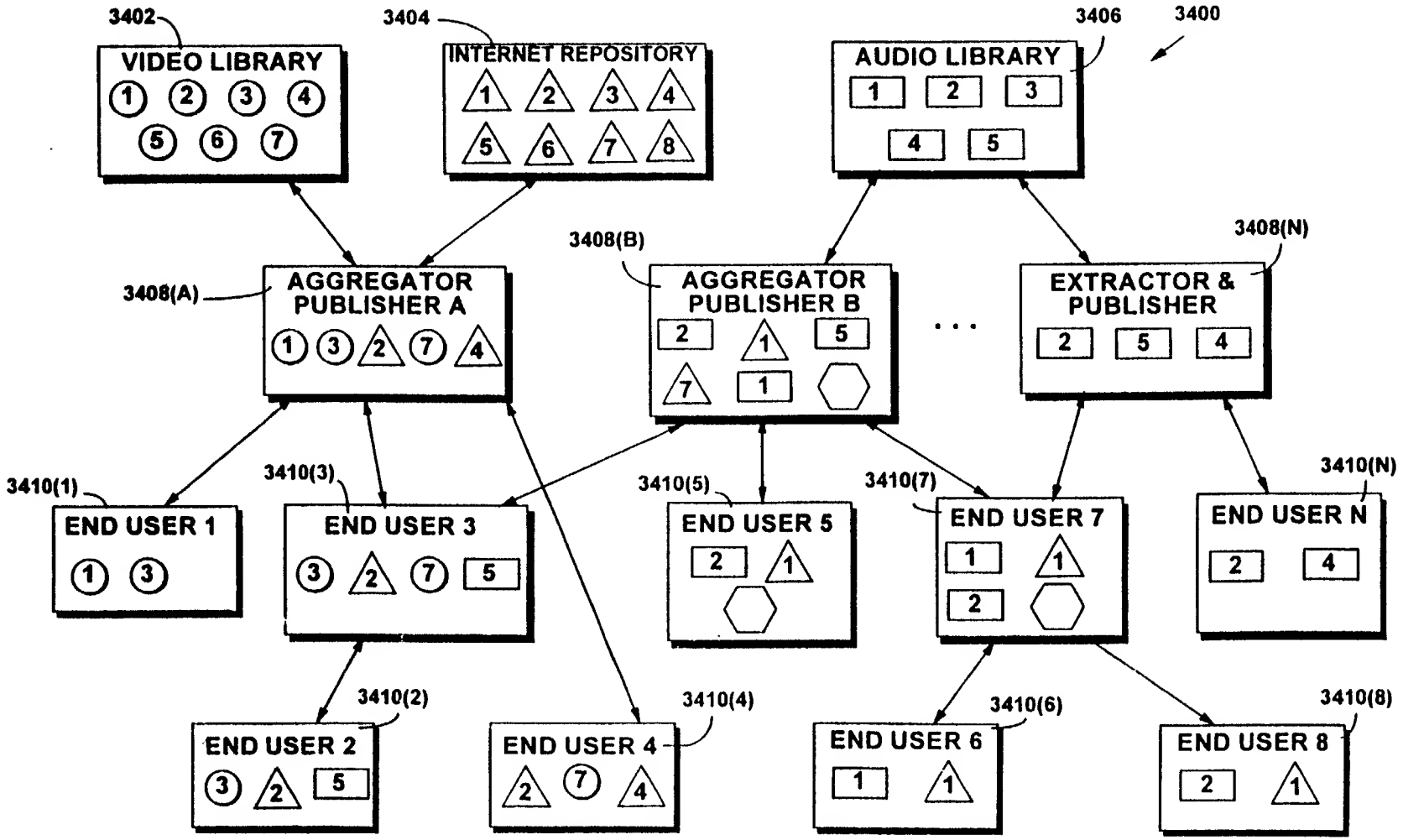


FIG. 85


300(A)
DISPLAY
EDIT
EXTRACT
DISTRIBUTE
BUDGET = $22,000
PRINT
300(B)
DISPLAY
PRINT
DISTRIBUTE
BUDGET = $8,000
3450
CLIENT ADMINISTRATOR
3452(1)
SALES & MARKETING ADMINISTRATOR
3452(2)
PLANNING ADMINISTRATOR
3452(K)
RESEARCH & DEVELOPMENT ADMINISTRATOR
A
DISPLAY
BUDGET = $2,000
DISTRIBUTE
B
DISPLAY
PRINT
BUDGET = $3,000
DISTRIBUTE
A
DISPLAY
EDIT
BUDGET = $10,000
DISTRIBUTE
A
DISPLAY
EXTRACT
BUDGET = $10,000
PRINT
DISTRIBUTE
B
DISPLAY
BUDGET = $5,000
DISTRIBUTE
3454(1)
USER 1
A
DISPLAY
BUDGET = $200
3454(2)
USER 2
A
DISPLAY
BUDGET = $100
USER 5
A
DISPLAY
EDIT
BUDGET =$1000
B
DISPLAY
BUDGET =$1000
3454(N)
USER N
A
DISPLAY
PRINT
BUDGET =$500
B
DISPLAY
BUDGET =$100
3454(5)
3454(3)
USER 3
B
DISPLAY
BUDGET = $400
3454(4)
USER 4
A
DISPLAY
BUDGET = $100
USER 6
3454(6)
A
DISPLAY
EXTRACT
BUDGET = $1000

Docket 02270.0268

FIG. 84



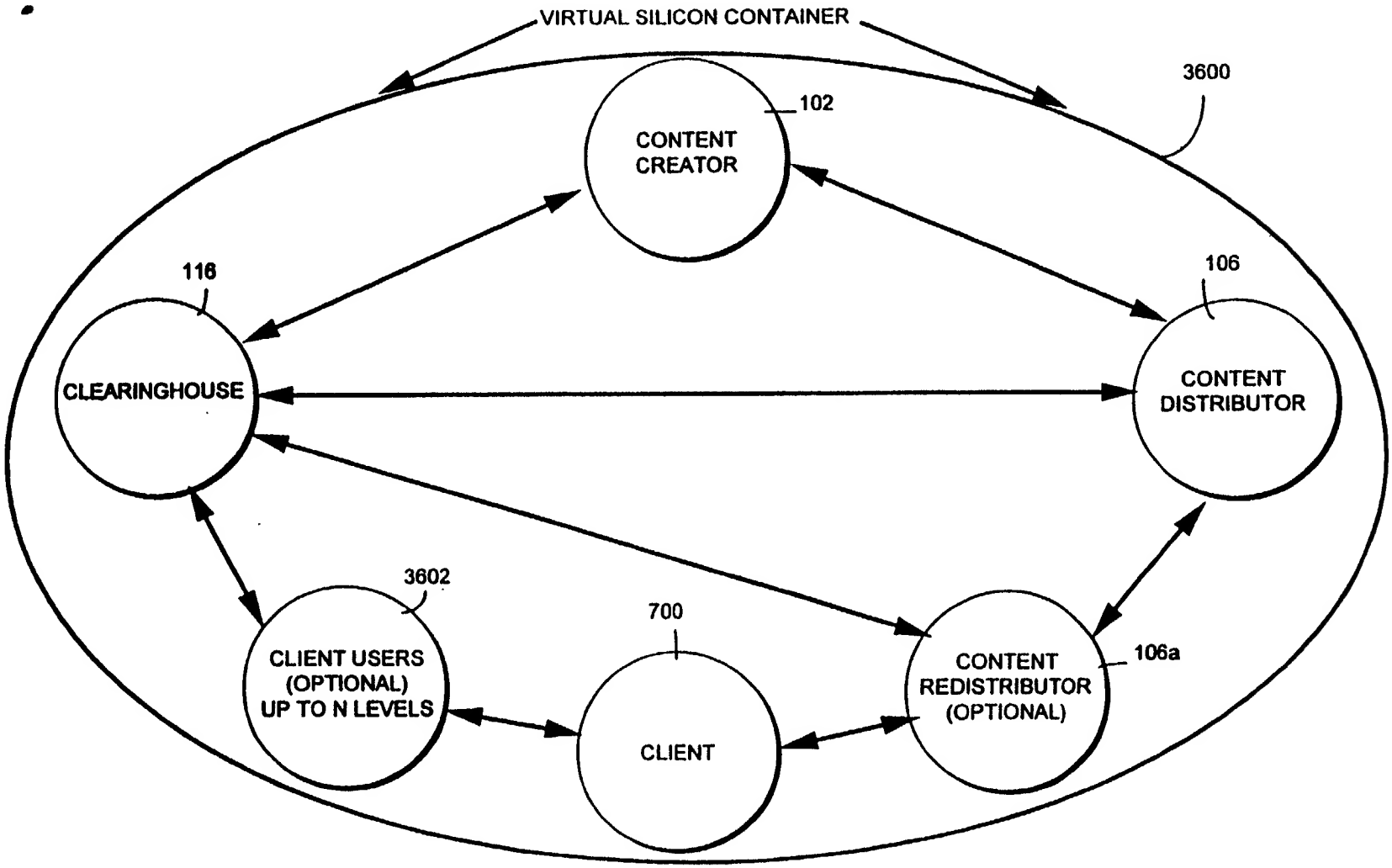

VIRTUAL SILICON CONTAINER
3600
102
CONTENT CREATOR
116
106
CLEARINGHOUSE
CONTENT DISTRIBUTOR
3602
700
CLIENT USERS (OPTIONAL) UP TO N LEVELS
CLIENT
CONTENT REDISTRIBUTOR (OPTIONAL)
106a

FIG. 87

Tuesday, 3:21:32 PM

FIG. 86

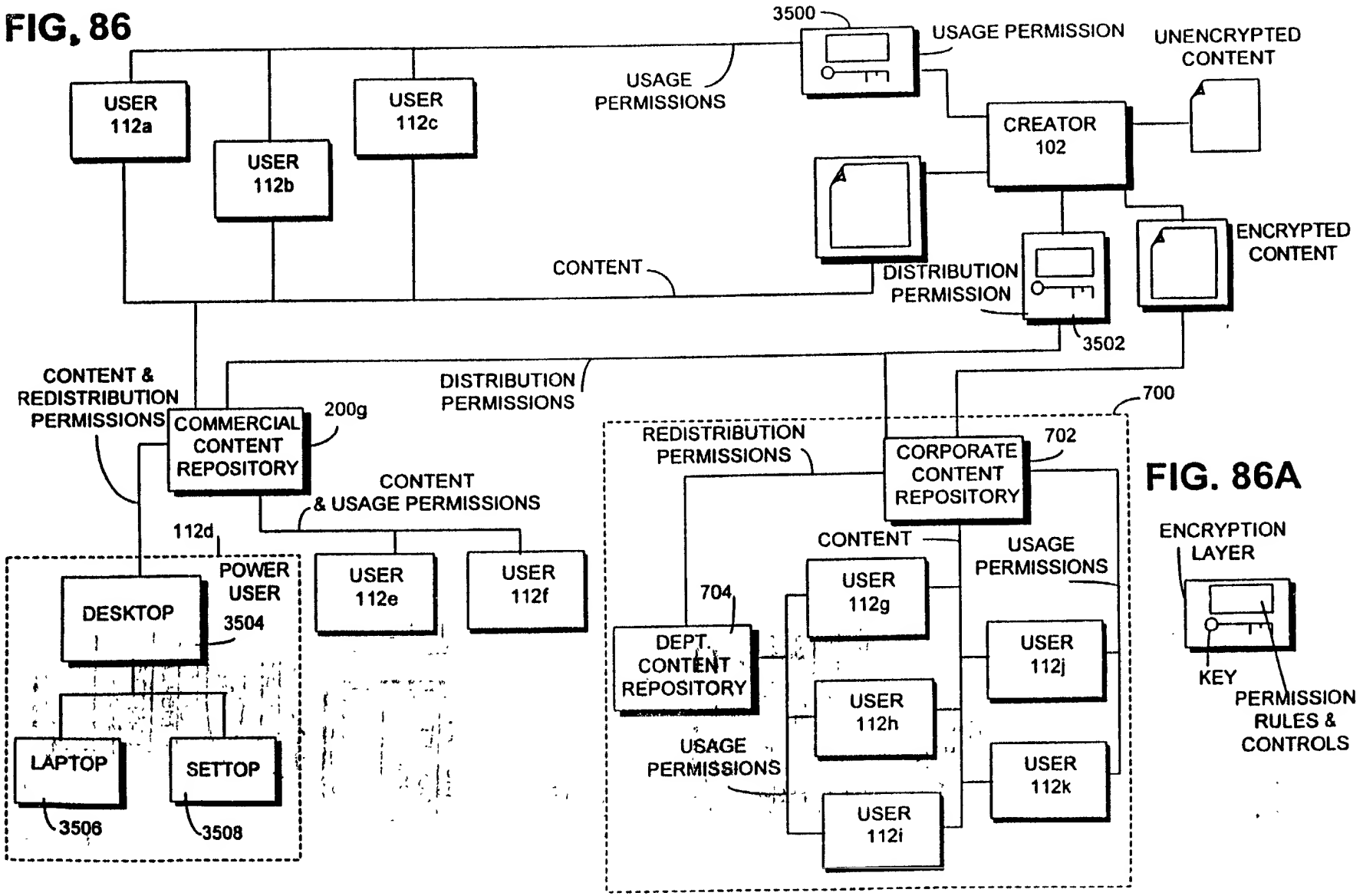


FIG. 86A